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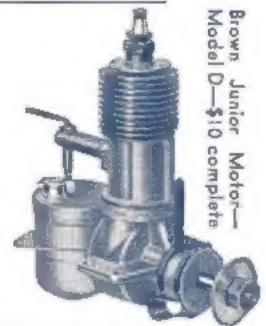
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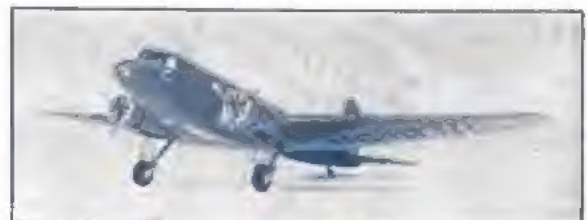
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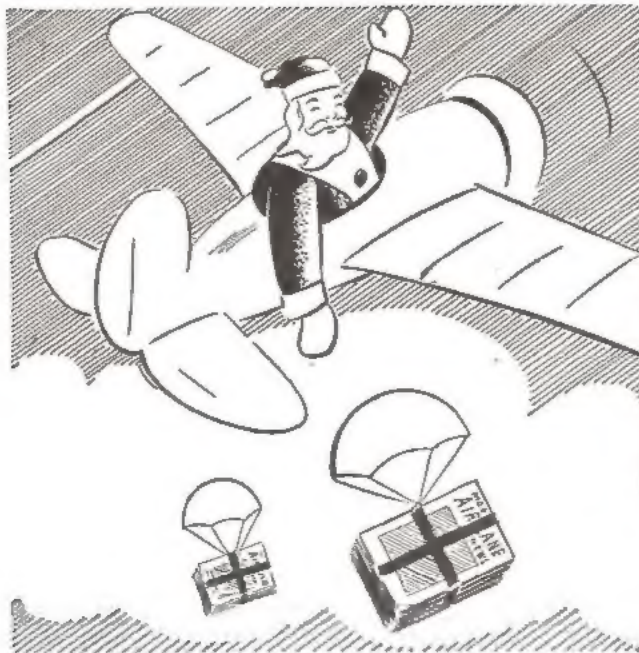


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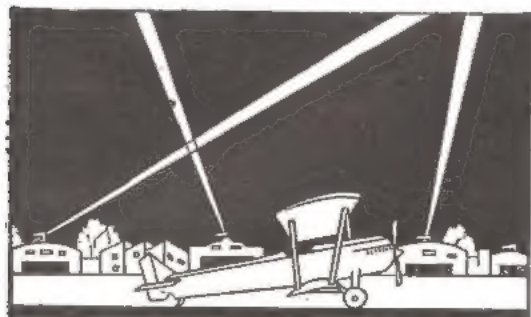
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VOLUME XXXI

JANUARY, 1939

NUMBER 2

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CHAPTER I

DEATH CLOUD

IT was only a flash—a blurred something in the darkening gray clouds above the A-18. Richard Knight stared up through the sliding hatch-cover. But whatever it was it had gone. He looked around at Larry Doyle, the Irish ex-Marine pilot who for three years had been his chief assistant in chasing down foreign spies.

"Did you see that?" he demanded. "I thought something went by above us, just a second ago."

"Yeah?" said the Irishman drowsily. "Maybe it was Lady Godiva on her white horse, or a couple of angels out for a little air."

Knight grinned. "The angels must have a pretty high cruising speed, then. My guess is that it was an Army or Navy ship from Norfolk or Langley Field."

"Ever hear of sea-gulls?" said Doyle. "We're over Chesapeake Bay, aren't we?"

"Birds don't fly in clouds," retorted Knight. "Go on back to sleep. In an hour we'll be in New York, and probably General Brett will have us jumping through the hoop again."

"Here I was all set with a flock of señoritas down at Rio," complained Doyle. "And now Brett busts up the show with one of his hurry-up calls. Don't we ever get a rest?"

"Apparently not," Knight said glumly. "I'm getting tired of it myself. I'd like to settle down a couple of months and devote my energies to studying the private life of the dodo."

"I thought all the dodoes were dead," said Doyle. "Oh—I get it."

"Your brilliance amazes me," retorted Knight.

Doyle glowered around his broken nose, sat back and switched on the special radio which had been installed in the Army ship. A moment later the amplifier blared out *Flat-Foot Floogie*. The Irishman swore and turned the dial. Then a smug voice preened out the words:

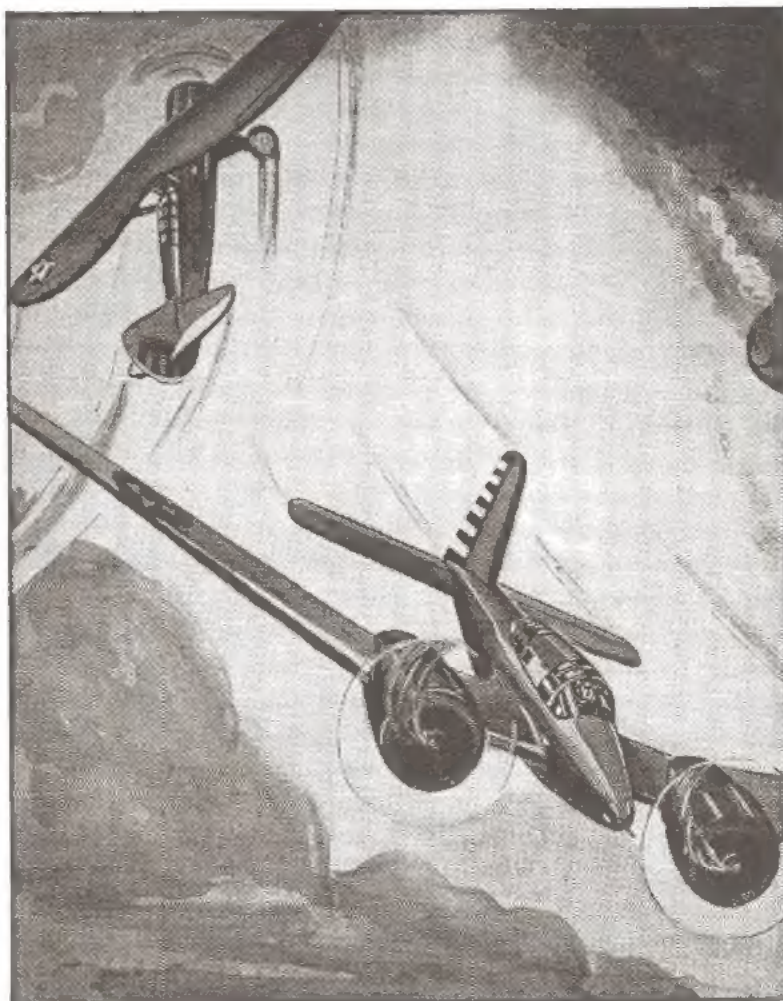
"And now we bring you the latest adventure of Secret Agent Z, the Super-Spy."

"Now there's a real agent," cracked Knight. "Leave it tuned in; we'll sit at the feet of the master and learn how it's done." "S'matter, jealous?" snickered Doyle.

"Certainly," said Knight. "He works only fifteen minutes a day, has Saturdays and Sundays off—"

"We interrupt this program," the voice of the announcer said with a sudden note of excitement, "to bring you a special news flash from Washington. General Hugh Bradman, Chief of the Army Air Corps, has just confirmed the mysterious disap-

Faked orders! Had he only obeyed them, Richard Knight, ace American agent, would have been spared his crushing downfall. But unknowing, he swung his sleek A-18 about—to hurtle it against the withering fires of a mid-air hell! And when he blasted a bullet into the henchman of the devil he tracked, his fate was sealed. For that man's arm bore an ominous emblem—a sinister symbol which was destined to cause Knight's own countrymen to turn against him!



pearance of an entire flight of pursuit planes. The planes, seven in number, took off three days ago from Langley Field for routine practice at high altitude. These ships, known as the P-26 type, were equipped with radio. But no messages or explanations have been received since their take-off. Army, Navy and Marine Corps squadrons have been secretly searching up and down the Atlantic coast and over a wide area to the west of Langley Field. But no trace of the missing planes has been found. . . ."

"Holy Jupiter!" exclaimed Doyle. "So that's why they had us dash up here in such a hur—"

"Listen!" Knight broke in tensely. The announcer's crisp voice went on:

"... Air Corps officials have refused to speculate as to what has happened to the flight. The story, carefully suppressed until today, came to light when families of the missing airmen broke the imposed ban with an open plea to the Secretary of War for nation-wide help in the search. From General John Brett, Chief of Army Intelligence, has just come a statement that a huge ground drag-net is already organized, including members of National Guards, C.C.C camps, Boy Scout groups, and other organizations. The names of the missing pi—"

STIRRING NEW DICK KNIGHT SKY MYSTERY

By Donald E. Keyhoe

Author of "Strafe of the Skull," "Riddle Over Rio," etc.

Illustrated by Jon L. Blummer



Freezing horror swept over Knight. For ghastly blue tendrils were streaming back from the face, throat, and fingers of the O-17 pilot. Like the writhing hands of some invisible monster, they were dragging him from the plane.

Doyle snapped off the switch, stared at Knight.

"A whole flight! What could've got them?"

"I don't know," Knight rapped back. "But one thing's certain—we've been tricked. Brett is in Washington, according to that broadcast. The order we got at Raleigh was faked—to send us to New York instead of Washington as the first message said."

"Then we'd better send in a flash," said Doyle, hurriedly changing the transmitter to their secret short-wave setting.

"No, hold it," Knight said sharply. "If there is any funny business, we don't want anyone to know we're wise—yet. It's almost dusk, and we can slip into Bolling Field after dark and send word back to Raleigh to nab that fellow who posed as a G-2 captain."

HE had already changed course for Washington, and now he opened the throttles of the two 1,000-h.p. Cyclones until the knifelike leading edge of the attack ship's wing was cutting the air at close to 300 m.p.h.

Twelve thousand feet below, the ragged shoreline of Chesapeake Bay was almost lost in the deepening dusk of the early December night. Patchy clouds above, and a solid layer much higher, completely hid the afterglow, leaving the sky a sullen gray, with here and there an occasional snow flurry.

Suddenly Knight lifted his tall figure up from the seat, gazed intently into the northern sky. Three ships

were vaguely discernible, cruising eastward above the bay. With a quick word to Doyle, he sent the A-18 zooming into a chandelle. As he leveled out, he saw that the planes were O-47A two-seaters, the latest Air Corps observation ships.

"They must be part of the search group," Doyle shouted.

Knight nodded, throttled the Cyclones to half-speed to keep from over-running the slow-cruising O-47's. The three ships began a wide turn, the pilots apparently about to give up the search because of the nearness of night. The pilot on the left pulled up swiftly as he saw the A-18. Knight banked, raising his hand in a signal. He was leveling out near the observation ship when Doyle gave a hoarse cry.

"Dick! Good Lord—look!"

Knight whirled in his seat, stared in consternation. A weird blue cloud a hundred feet in diameter had appeared directly in front of the two other O-47's. A perfect sphere, its smoky mass expanded at such amazing speed that before either pilot could turn away they were engulfed in its bluish mists.

As Knight swept the stick back there was a muffled detonation from below. Vivid blue streaks shot from the still expanding cloud, then the battered wreckage of one O-47 plunged into sight. As it dropped from the deadly cloud, the plane burst into sickly colored flames, but before Knight could take more than an amazed look the second observation ship appeared.

A freezing horror swept over him. The forward enclosure was open, and the pilot had clawed his way half out of the cockpit. Ghastly blue tendrils streamed back from his face, his throat and fingers, like the writhing hands of some invisible monster dragging him from the plane.

From prop to tail, from wing-tip to wing-tip, the ship was covered with the eerie bluish mist. The observer was fighting his way out of the pit, his features a picture of horror dimly visible through that hideous blue veil. Half-way out of his seat, he collapsed and fell back.

Hardly realizing what he did, Knight circled about the stalled ship, noticed that the prop had now ceased to turn. The pilot pulled himself free, and his lips opened in a soundless scream. Then he threw himself into space. As he fell, his hand grasped at his parachute ring, and the white silk whirled open above him.

A groan burst from Knight's lips. The sinister blue cloud was trailing down over the chute, licking the edges. Sickened, helpless, he watched it spread like some slimy ooze over the billowing silk. A ragged hole appeared, then the chute burst and tore in a dozen spots. The luckless pilot went plunging down to his death, and the gray sky swallowed him up.

Knight shuddered, looked back toward the pilotless ship. It was starting to spin, but even in that brief instant he saw that the hatch-enclosure had rotted through as from some powerful acid. For one awful moment he saw the observer's face. It had turned a terrible blackish blue, as if a weird and invisible fire had swept across and scorched it.

The mysterious blue cloud had spread until now it was fully five hundred feet in diameter. Slowly it lost its opaqueness, dissolving as it settled. Knight turned, saw his own emotion mirrored in Doyle's stunned eyes. The Irishman's lips moved, and the Q-Agent caught the words: "What in heaven's name was that?"

He grimly shook his head and turned to look for the ship which had escaped. Then he gave a shout of dis-

may and snatched at the throttles, opening them wide.

An unmarked Seversky Demonstrator was plunging headlong toward them!

BUT for that second of warning they would have been finished. Flame streaked from the Seversky's cowl, and a vicious burst ripped through the star insignia on the A-18's right wing. Knight slammed the Cyclones full open, and the two-seater screamed up in a furious corkscrew turn. The sleek amphibian overshot them. And as the pilot frantically zoomed, Knight saw that his face was covered with a full-size oxygen mask which, with its built-in lenses, gave him the look of some Martian monster.

The remaining O-47 had apparently been the Seversky pilot's first target, for it was whipping around from a hasty turn. As Knight thumbed the gun-control on his stick, the observation ship charged to one side, and then Knight realized that the Douglas was unarmed. The Seversky shot into a vertical bank, darting across the path of the helpless two-seater. For an instant, the secret agent saw the glaring eyes of the masked pilot twitch toward him, as the huge glass eye lenses flashed in the fading light.

He pressed the rudder, stabbed a venomous blast across the amphibian's tail. But before he could range the cockpit, the O-47 blanked his fire and he was forced to make a quick split-S to avert collision. Behind him, Doyle's guns roared—then as abruptly stopped. He heard an oath rip from the space behind him, and as he hurriedly banked he saw Doyle staring down under the wing. For the second time a freezing hand seemed to clutch at his heart.

Another eerie blue cloud had materialized, seemingly from nowhere—and beyond it, swiftly vanishing, was the Seversky!

Even as his thumb jerked up to the gun-control, the masked pilot twisted squarely behind the expanding cloud. A flitting instant, his wings showed phantom-like through the edge of the mass, then the thicker mists in the center hid the Seversky from view. Knight tripped his guns and fired into the cloud, zooming at the last second to avoid diving into it. When he leveled out above the sinister blue sphere there was no trace of the amphibian.

"Maybe he dived inside of it!" bellowed Doyle.

"Keep your guns ready," Knight flung back. Then he raced the Curtiss around the blue cloud, reversing direction twice and diving underneath. But still there was no sign of the Seversky.

Meanwhile, the O-47 had fled in the direction of Langley Field, and there was soon only the slowly dissolving cloud and the A-18 remaining. Knight waited tensely, ready to fire. But after a minute he slowly lifted his thumb from the button. He could now see through the cloud—and the amphibian was not inside.

"He must have given us the slip," muttered Knight. "Unless you believe in ghosts—and I never heard of a ghost-plane."

The Irishman's belligerent face was a trifle pale.

"Let's get away from that damned thing! It gives me the creeps."

Knight climbed steeply, boring through the cumulus layer until he broke into clear air at 16,000 feet.

"Dick, where did that cloud come from—and what could it have been made of?" Doyle demanded suddenly.

"You've got me—on both counts," Knight said in a grim voice. "The cloud we first saw was there at least a minute before the Seversky appeared. So it had to come from some other source—but there wasn't a thing in sight."

"And that ship didn't have any number, either. No way to trace it."

"Almost impossible," agreed Knight. "They've exported those amphibians to half a dozen countries."

BOTH MEN were silent during the remainder of the short flight to Washington. The distance was sixty miles, and the A-18 made it in just twelve minutes. Knight came in on the radio beacon until the two-seater broke through into light snow at 8,000 feet. Spiralling down above Anacostia, he watched the red and green lights of Bolling Field shine dimly through the furies.

The ship was at 3,000 feet, when the Bolling Field floodlights suddenly went on. Knight frowned. He had hoped to land unobserved, using his wing-lights at the last moment. But at that, there was little probability that the ship could be identified unless some one were lurking near the hangars when he taxied in. He noted the wind direction from the lighted marker tee, made a wide turn and started to let down the wheels.

But he had hardly touched the retractor-gear, when two fuzzy orange streaks shot past the left wing. Above the drone of the idling Cyclones came the muted pound of synchronized aero machine-guns.

Knight's hand leaped to the throttles, and the thundering motors hurled the attack ship into a tight reversal. The other plane whipped around, brightly silhouetted in the floodlight glare, and he saw that it was a P-26. Doyle was already swinging his guns, but with an expert snap-roll the fighter was out of his range and drilling in at the other side of the two-seater.

Smoking tracers tore through the hatch-enclosure above Knight's head, and a torrent of solid slugs battered the instrument dials. He shot into a tight Immelmann, trying to catch the zooming P-26 as it came up after them. His quick burst missed. And before Doyle could swing his guns to the other side, a searchlight whirled a dazzling beam up to spot the battle. In a twinkling, the fighter twisted aside and came racing up the beam, firing as it zoomed. Cursing the searchlight crew, Doyle blasted wildly into the glare, while Knight hastily reversed to shake off the beam.

Another fusillade crashed through the riddled enclosure, missed Knight's bent head by inches. Then, strangely, the attack broke off, and at the same time the light beam shifted. Knight banked, saw another A-18 charging in with its forward guns blazing at the P-26. Trapped, the fighter pilot swerved violently to the left—and straight into the fiery hail of Doyle's spouting 30's.

With a convulsive leap, the pilot fell over his stick, and the P-26 went screeching down through the snow-lined sky. Knight watched it melt into the ground below, a dark, shapeless spot upon the whitened earth. The searchlight pounced upon it, and Knight glided swiftly toward the end of the field where it had fallen. The other Curtiss swung in beside them, and as they went lower Knight recognized the pilot's face in the reflected glare.

"Hell's bells!" Doyle said. "It's old 'Stony Heart'."

Knight grimaced. Of all the men to have to thank for helping them out, it had to be Justis Hart, with whom both he and Doyle had clashed a dozen times.

CHAPTER II

SIGN OF THE FIENDS

AMONG all the scores who knew him, Knight had yet to meet a man who called "Old Stony" a friend. A grim martinet of a man, Hart had fought his way up in aviation circles until now he was the air expert of the new secret Defense Coordination Board created by White House order and linked with Army and Navy Intelligence.

He had trained with the U. S. Army, served on three airlines, had been a soldier-of-fortune in China, Spain, and a half dozen other countries, coldly, methodically storing away facts and figures about foreign air services

(Continued on page 52)



They Had What It Takes

XXIV—"JACKIE" COCHRAN—ACE WOMAN SKY RACER

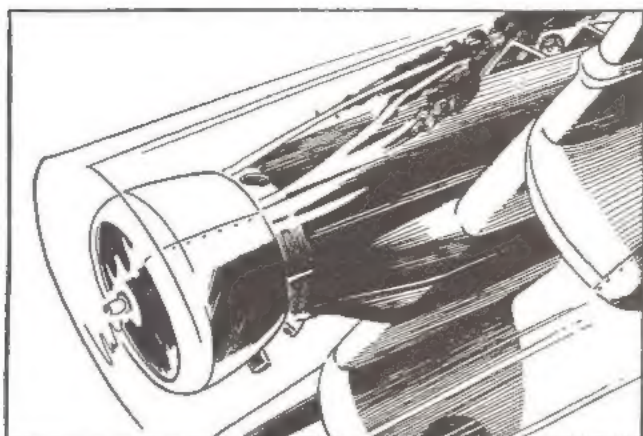
By ALDEN McWILLIAMS



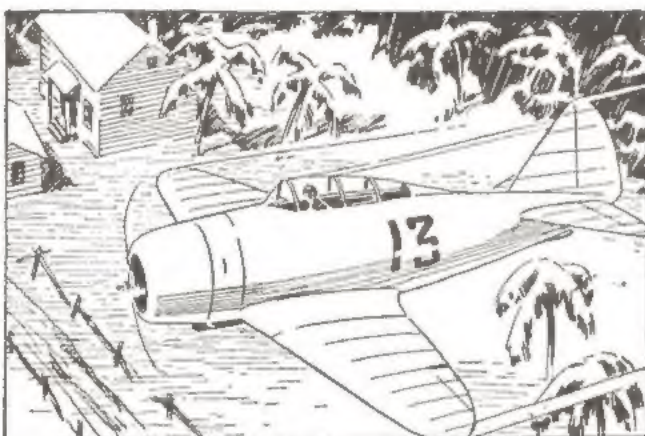
1—Left an orphan soon after her birth at Pensacola, Fla., in 1909, Jacqueline Cochran worked in a beauty parlor at the age of 11, took up nursing at 14, and became a graduate nurse at 19. Next, she came north and took a position in a beauty salon in New York City. Then, in 1932, aviation attracted her—and she learned to fly in only 2½ weeks!



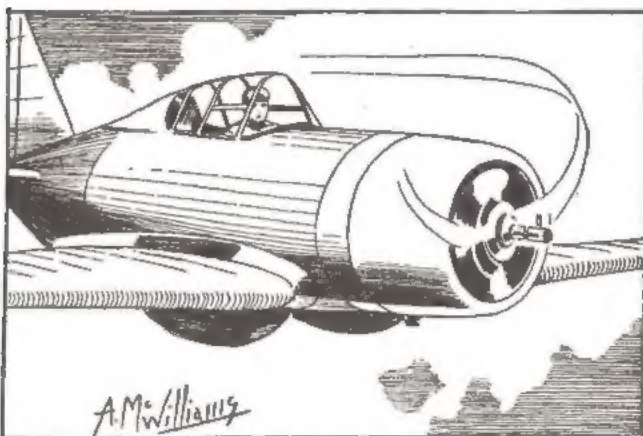
2—Jackie then bought a Travel Air—and cracked up in it when its motor failed on a take-off! But that didn't discourage her. "I'll get into air racing!" she decided. And financially backed by Floyd Odlum, her future husband, she entered the Gee-Bee Q.E.D. in the London-to-Australia dash of 1934. On this effort, Wesley Smith was her co-pilot.



3—Unfortunately, she was forced out of that sky grind near Bucharest, Rumania, when her stabilizer broke. Still she wouldn't give up her racing ambitions, though meanwhile further bad luck dogged her. She had to drop out of the '35 Bendix race in Arizona, and in '36 she just managed to land safely in her Northrop that had caught fire at 8,000 feet.



4—Then in '37 things clicked for Jackie! She chalked up a new woman's speed record of 293 m.p.h., flew from New York to Miami in 4 hrs. 12 min. to better Howard Hughes' time by 8 min., and into the bargain took third in the Bendix race in which she was the only woman flyer! As 1937's outstanding aviatrix, she was awarded the General Mitchell Trophy.



5—And last September, Jacqueline Cochran soared to new heights. Pitted against nine expert male flyers in the gruelling Bendix classic, she neatly copped first place in the Los Angeles-to-Cleveland dash, then roared her sleek Seversky on to the East Coast for an added transcontinental prize. This brought Jackie's total race "take" to \$12,500!



6—"Stick to your ambition until you win!" With that motto, Jacqueline Cochran "sparked" her climb to aviation's Hall of Fame. What's more, Jackie has also done wonders with that same motto in the business world. For entirely "on her own" she's built up an important cosmetic trade. And in her workaday life she flies from city to city to promote it.

—So They Went to

"They're world beaters!" Anyhow, when new war planes are rolled out of the shop, that's the story the publicity lads give out. But it took Fact-Hawk Dave Cooke to dig up the story they don't give out—the "last-chapter low-down" on the dud jobs. Here it is—the most revealing military ship article we've ever put your way! The "inside" dope on the fighters that flunked—

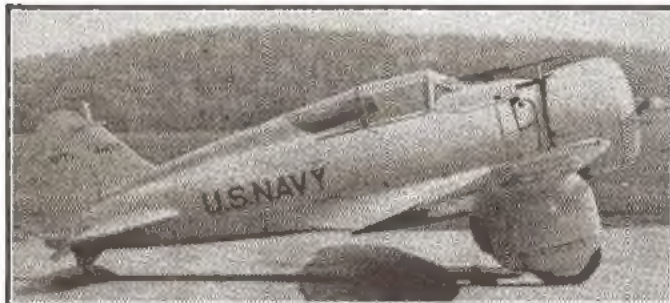
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By David C. Cooke

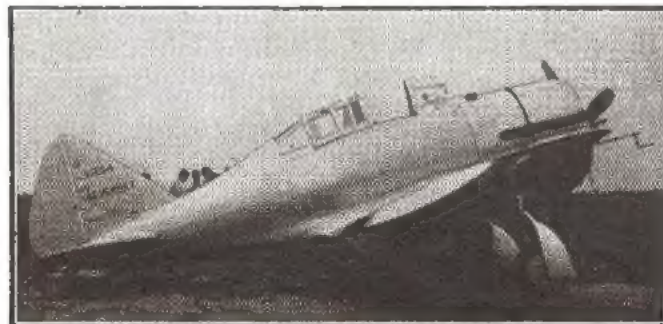
Author of "Transocean Triumph," "I Got a Job With Seversky!", etc.



Too slow and too heavy. That was the verdict on this Boeing XF6B-1 single-place fighter brought out in 1933. It was a slightly modified version of the famous F4B-4.



It looked as though Northrop really had something that would ring the bell with the Navy when they submitted this XFT-1 single-seat fighter back in 1936. But it proved to be too hot on landings.



Seversky offered just one ship to the Navy—and it was handed right back. This sleek 1937 NP-1, sister of the P-35, was the ship. It was a little too speedy—in landing velocity and construction cost.



Left: Bad luck was the trouble in the case of this 1933 Douglas XTSD-2 torpedo plane. According to all accounts, it was an Okay ship. But it got the cold shoulder when the Navy suddenly decided to specialize on general-purpose jobs.

IT'S common knowledge that this business of turning out fighting planes has always moved along at a fairly good clip. And now that a score of the world's nations are playing a grim game of drop the handkerchief with old man Mars, it's revving up faster than ever.

That's meant that a striking line of new military jobs has been continually buzzing off the various aircraft production lines of our war-like orb through the years. And we don't have to tell you that plenty of publicity, both of the straightforward and hush-hush variety, has heralded these craft.

We read that the So-And-So firm has brought out a startling pursuit ship that'll "outfly any fighter yet produced," that the new Watchamacallit bomber is "the very last word in 'egg' droppers," and that the latest Insertnameof observation plane "will revolutionize aero reconnaissance."

Well, fellows, after you've read a bundle of enthusiastic copy like that (and we all read it) the idea sinks in that our big-shot battle plane designers never miss—that when the brass hats at Washington ask 'em for a better military machine they simply turn it out, and that's all there is to it.

THEY never miss? Don't you believe it! That's just a goofy notion that's got around due to the fact that when the Whatchamacallit bomber and Insertnameof observation job failed to make the grade, the publicity boys put the soft pedal on it. And I mean *soft*. In fact, ninety-nine times out of a hundred you never hear a word to the effect that a highly-touted war plane actually was a dud. All of which is human nature on the part of the company's say-so chaps, for few of us go around ballyhooing our boners.

Anyhow, it is a fact that many big-name ships don't pass muster. To be frank, when our Government—or any other government—wants new ships, it's a case of "many are called but few are chosen."

To get down to brass tachometers, we wanted to give you FLYING ACES readers the real inside info on these ships that got the thumbs-down sign from the Powers-That-Be at the Capitol. So we delved into the files to clear up some of these cases of failure to publicize failures. And we got so much dope that this trip we're going to confine our revelations

the Navy Boneyard!

to the sea arm jobs—the planes built for the U. S. Navy. Here's the story, just as it was logged in the big black ledger—

After the Navy Department approves a design and puts its final Okay on the dotted line, one plane of that particular type is constructed under rigid Naval supervision. The Navy foots the entire bill for this first sky buggy, and when the finished craft leaves its home field the outfit that created it loses all claims to the new flyer, other than those referring to basic designs. Henceforth, even though the ship may carry the producing firm's call numbers, it is as much a part of the sea service as a gob that signs up for twenty-one bucks per month, plus a pair of dungarees that knock the dames on Riverside Drive for a bunch of sweet peas.

The first step in experimentation on the finished ship calls for a series of test dives at the factory site. If the bus gets by with its wings still hanging on and with its empennage still intact, it is ordered either to the Navy Proving Ground at Dahlgren or at Anacostia. And then the fun *really* begins!

Yes, when the "guinea pig" plane sets its trucks down at one of these proving grounds, it goes through a series of the most exacting tests that have ever been cooked up by the master thinker-uppers. It is tested for terminal velocity, carrier deck operations, tensile strength of wings, sensitiveness of controls, climbing characteristics, recovery from spins, and a stack of other assorted gyrations that make the life of a test pilot unpleasant.

If the skyster comes through these tests without the aid of a pair of crutches, it is, in most cases, accepted. If not, it is usually sent to one of the Navy boneyards—usually to the Naval Aircraft Factory at Philadelphia, where it will droop in the gathering dust until the termites play havoc with it or crystallization sets in.

True, we have seen the advent of a new construction plan put into effect by the U. S. Navy. But we can still tell you, without being afraid of a political purge, that every big-time company that's built sky craft for our Navy has suffered at least one set-back in the rejected ship category.

The Boeing Company has been supplying fighters to our sea arm for years on end, but still they haven't bowled 300 in the Navy plane league. The first ship to be a draw-back in the Boeing career was the XF5B-1. This was a single-place 425-h.p. Wasp fighter with a parasol wing. No performance figures were released here in America concerning this job, but from foreign sources it is learned that it did a neat 250 m.p.h. plus.

Even so, after our rigorous Navy tests it was promptly put on the "ain't" list. Just why, we haven't been able to learn exactly. But the lines of that plane certainly proved popular enough. Unless our eyes have deceived us, the Japanese Nakajima 91 pattern wasn't far afield of it.

In 1933, Boeing again took it on the chin when their XF6B-1 was rejected. This ship, a slightly modified F4B-4, was said to be too heavy and too slow. The XF7B-1 which followed was also rejected and without a margin of a doubt—for it ripped to pieces in a test dive at

Right: Our Navy turned thumbs down on several B/J ships. In the case of this XFJ-1, a lower wing too close to Mother Earth was the fly in the soup. It hit one day—and ground looped the job into a total wash-out! (Official U. S. Navy Photo.)



Brought out in '28, this Great Lakes XSG-1 was the successor to the old Loening "flying" thing. Considered unwieldy for modern tactics, she, too, got the "nothing doing" tag. (Official U. S. Navy Photo.)



"Very poor forward visibility, too slow, weak wings, and a tendency to toss bits of fabric hither and yon!" Yes, they certainly had plenty of reasons for sending this 1929 Fokker XFA-1 fighter to the boneyard! (Official U. S. Navy Photo.)



On the visibility score, the Curtiss XF13C-1, shown above, rated A-1. But the marine judges found her wanting in wing-section strength. "Chalk up another black ball—and bring on the next ship!"





Vought has turned out plenty of successful observation skytars for our sea arm. But not all of them were received with smiles. This one—the XO4U-2—was greeted by the admirals with frowns.



Roy Grumman hasn't made it every time, either. Here's his XSBF-1 which failed to get by because it was too slow with a 650-h.p. engine and wasn't stressed to take a bigger power plant.

Anacostia. So they tacked an R.I.P. sign on the remains. Since that time, the Boeing firm has concentrated on the Army, where it's now enjoying success with the gigantic four-engined "Fortress" jobs.

Bellanca had a sad experience with his XSE-1. When this job was being test-dived at the factory, it went into a spin from which it never recovered. And when it was rebuilt as the XSE-2—it was also rejected. Still undiscouraged, Bellanca went on to build the XRE-1 and XRE-2, only to have these two turned down as being too slow for Navy work. But the New Castle designer still plugs away at it. The last we heard was that he's working on a new Navy job which should be rolled out of the plant sometime before the first of the year.

BUT it was Berliner-Joyce that suffered greater drawbacks than any company that has ever tried to sell over the counter to the Navy. Although they achieved some success in the Army with their P-16's, they were completely out of the picture with their XFJ-1, XFJ-2, XF2J-1, and XF3J-1.

The first named—the XFJ-1—was an odd looking biplane that had its fuselage "stilted up" above an extremely low-set bottom wing. Anyhow, this lower wing asked for it—and got it! It hit one day, ground-looped the plane—and the job was a total wash-out! B/J quickly followed through with the XFJ-2, which was fundamentally the same design with the exception of a longer landing gear. But the landing speed on this one was said to be too high for carrier deck set-downs, so it also was hung with black crepe. Then the XF2J-1, a two-place fighter of conventional design, was rejected because it was too heavy and too slow. And finally there came the XF3J-1—only to be black-balled like the rest. What caused the last turn-down? Well, we couldn't find out, but maybe by that time it was a habit.

Curtiss, a contributor since pre-war days, suffered

set-backs with such modern types as their XS2C-1, XF12C-1, and XF13C-1. The first of these was the Navy version of the Shrike. Powered with the first and only Twin Whirlwind ever to see service, it was rejected because it afforded too little visibility for the pilot.

As for the XF12C-1, she blew up during trial flights at Buffalo and was consequently scratched off the "maybe" list without further ado. The XF13C-1 was almost structurally the same as this XF12C-1, differing only in that she was strengthened considerably around the wing-root. We understand, however, that this bus was rejected because of too little strength out in the wing section. Indeed, the comment was hazarded that Curtiss got too good with the visibility feature in both the XF12C-1 and XF13C-1, all to the sacrifice of strength. And so came the Navy frowns.

Douglas came out with an interesting torpedo plane in January, 1933. This four-placer, built experimentally, was chosen for the first service test installation of the then new Twin Wasp engine to prove its adaptability for heavy-duty single-engined airplanes. Dubbed the XT3D-2, this job was tossed off the runway—also the XT3D-1 into the bargain—because that same year the Navy decided to specialize in ships that could be used for more than one purpose (planes like the BF2C-1, PBV-1, etc.). Bad luck, what? And then the Douglas types XO2D-1, XFD-1, XP3D-1 and XP3D-2 were also rejected, reasons undisclosed.

On the other hand, it's difficult to say which one of several reasons caused the 1932 Fokker XFA-1 to be rejected. Guess you'll have to be content with the following bugs: Very poor forward visibility, too slow, weak wings—plus the ungentlemanly habit of throwing a hunk of fabric every once in awhile. Aside from all that, it was a pretty good ship!

Since the early days of 1929, Roy Grumman has been
(Continued on page 72)



Another Douglas that was written off was this stolid KP3D-2 patrol boat. But unfortunately we can't tell you why our experts of the bounding deep didn't want it. "Rejected for undisclosed reasons" was the only notation the author's digging could uncover.

Clash Over the Carpathians

THE DRAMATIC STORY BEHIND OUR COVER PAINTING

* * *

R EICHCHANCELLOR HITLER, having enjoyed two bloodless victories in his grab of Austria and of the rich regions of Czechoslovakia, is not likely to stand still now that he has tasted the full fruit of triumph.

The Austrian coup, we are told, was to be expected. Indeed Austria, the true Fatherland of *Der Fuehrer* and an ally of Germany in the World War, was decidedly Teutonic in the first place. So the stock of its people apparently favored coming into the new German Empire. In all possibility, they believed that such a union would be to their benefit. At any rate, no real battling effort was made to prevent Hitler from taking over.

In the recent Czechoslovakian crisis, however, Hitler faced real opposition—opposition which, had it won the backing of one or two major powers, might have ultimately resulted in the complete downfall of the Nazi system.

Certainly the Czechs were game and ready to scrap it out. They had an army worthy of making a brave stand until outside aid arrived. They were well entrenched, well equipped, and well trained. History, in years to come, will perhaps be able to analyze this situation and tell us what *might* have happened had the Czechs made a stand against Hitler's threat to invade their country.

There is, surely, every reason to believe that it would have started another World War.

Why the main European powers did *not* step in may have several answers. One is that neither Britain nor France believed that they were ready for such a war. And this viewpoint was greatly effected, we are now told, by a belief that Germany has a surprisingly large and efficient air force plus a massive army.

Of course, Russia declared herself strongly enough. But it's now inferred that Britain and France were not given what they felt was real proof of the vaunted Soviet strength, and thus were left wondering how much the Red Star government could be relied upon to put up any sort of a fight.

The British and French remember all too well the fiasco of the "mighty Cossack army" during the World War and even further back to the Russo-Jap war when the Czar's men failed to prove they could really either "give it" or "take it."

In the "Happy Landings" department of this issue of F.A., we have taken up the mystery of Germany's air strength and have shown how it is impossible for any nation to develop a first class air force in three years. However, the Nazi propaganda bureaus have so brilliantly put over the story of German strength that many believe her to be the greatest air power in the world.

Such, however, is not the case, even though we do not question the man power available in the Fatherland, which has adopted the most intensive form of compulsory military training. But in any event, Germany's navy is admittedly inferior to that of Britain or France.

However, the state of mind of a nation has much to do with the declaration of war. The British wanted no part of it. They feel today that they got the bad end of the deal in the '14-'18 scrap, having spent 40 billions of dollars and suffered casualties of 692 thousand men killed and two million wounded, together with a total loss of nine million tons of shipping. France felt much the same way about it. Meanwhile, the German population, fed by a controlled press, knew nothing of the actual conditions. They didn't know how close they were to a devastating war until the real crisis had passed.

Of all the people who breathed a sigh of relief when it was all over, probably none breathed deeper than Hitler himself, who must have realized that his country was in no position to carry out a drawn-out war. He knew he needed more coal, more iron and more petroleum to carry on hostilities. And where he was to get them, once the British and French fleets had bottled up his shipping, was a question.

A ND NOW to the story of our cover painting: To the east—the south-east, to be correct—lies Rumania, now near at hand, via the Danube River, because of the Austrian grab, or by way of the passes in the Sudeten Mountains recently taken in the Czech gobble. These two routes focus in the heart of Rumania. And there Hitler could get farm products, petroleum, lignite, steel ingots, salt, natural gas and bituminous coal in big quantities. In 1936, for example, Rumania produced 63½ million barrels of oil!

No wonder *Der Reichsfuehrer* availed himself of the Sudeten area, thus providing himself access to the main path through the Carpathians!

And so it's said that Hitler's next move will be toward Rumania. He would first make a pact with Czechoslovakia, which would be easy, considering the state of mind of the Czechs. Then he might attempt to frighten the Rumanians into an early submission with his new long range Heinkel-111 bombers. They could follow the great finger of the Carpathian Mountains, which curl along the border of Poland and Czechoslovakia and indicate the way to Bucharest.

But Rumania has an air force, too—and she has fine equipment. Our records indicate that early in 1938 Rumania had 800 first-line planes, and this air arm is reported to be high in efficiency, with nine complete fighting squadrons, four bombing squadrons, four night reconnaissance squadrons, two night-fighter squadrons, three seaplane squadrons, five balloon companies, and a central repair depot capable of accommodating 100 planes at a time.

Mr. Schomberg's cover illustration portrays the probable scene if Germany attempts to raid Rumania with her 254-m.p.h. Heinkel 111's, each of which carry more than two tons of bombs. The defending craft are Rumanian I.A.R.15 fighters, which do 232 m.p.h. and mount two fixed guns. If properly handled, these jobs may prove more than a match for the Heinkels, which, if the truth be told, are simply revamped versions of the type 111 transports.

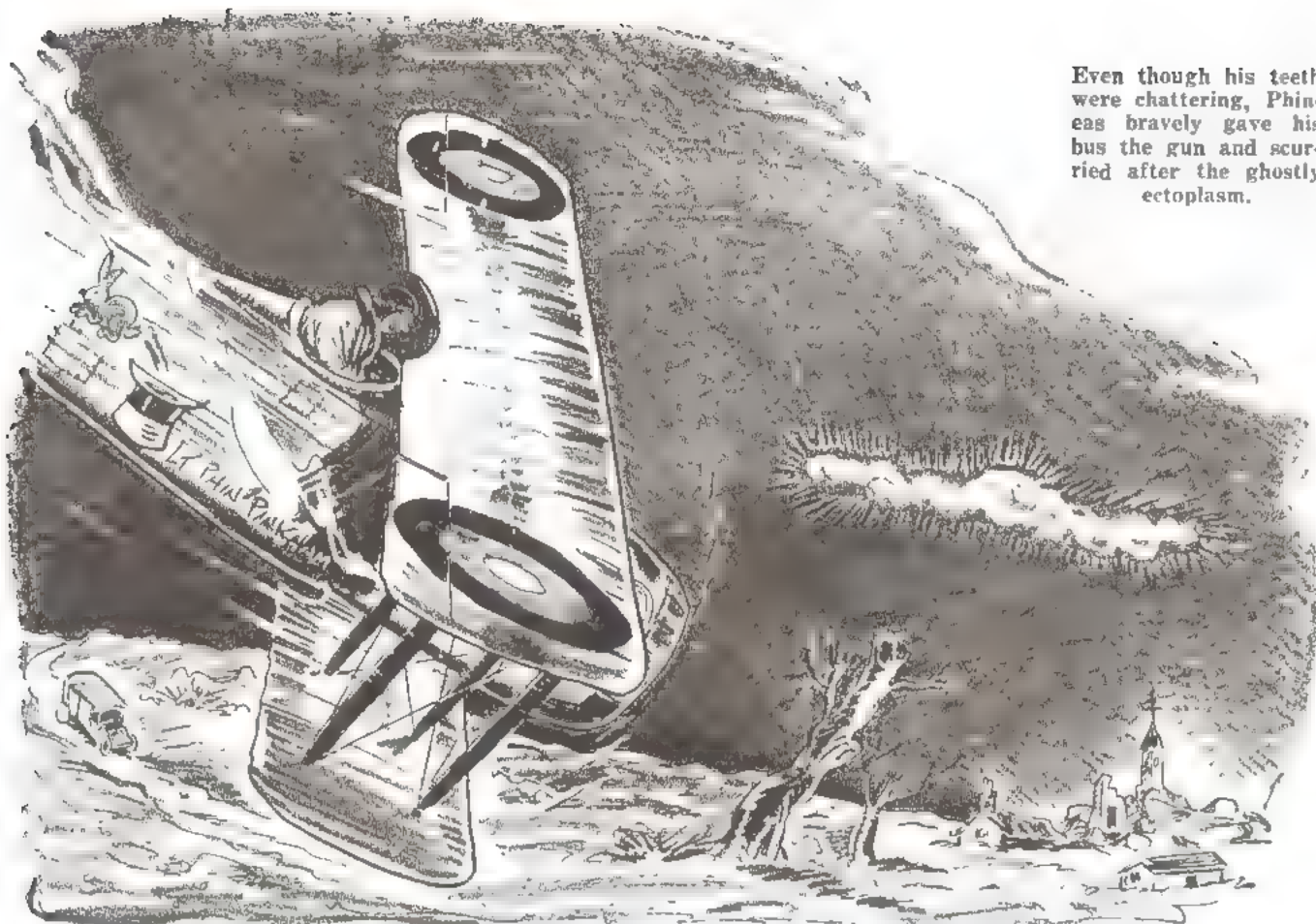
Military men today know that while it is easy to convert transport planes into bombers, these planes seldom prove to be top-notch military ships in actual practice. To replace passengers seats with interior bomb racks in such manner that the center of gravity is not seriously changed once the bomb load is released, is particularly difficult.

Thus we find another reason for questioning the ballyhooed strength of the German Air Service, if they are trying to make the world believe that they can turn all their transports into really deadly bombers overnight. It may well be that they'll prove deadly to the men who fly them—rather than for the enemy!

At any rate, we may find out quite soon. For keen observers declare Hitler has only "begun to grab." His eyes are toward the east—and his next move may bring a clash over the Carpathians!

Hitler's eyes are
toward the east!
And his next
grab may be—
Rumania!





Even though his teeth were chattering, Phineas bravely gave his bus the gun and scurried after the ghostly ectoplasm.

A Haunting We Will Go

THERE'S nothing new under the sun. The P.W.A. of the Caesars built the first subway and called it The Catacombs, the China boys mixed up a batch of gunpowder thousands of years ago, and the Egyptians concocted an embalming fluid that makes the formaldehyde used by the corpse tidiers of the present age seem like dish water.

What's more, the Heinie mental giants of 1918 cooked up a syrup that was the same stuff that crime detection tycoons of the present day call *scopolamine*. You know—the jiggle water that makes a crook tell the truth with all the honorable gusto of a George Washington.

Now, in the aforementioned year of the Big Riot, Lieutenant Phineas "Carbuncle" Pinkham took a long hop, figuratively speaking, in an astral plane and came down to earth with the Zodiac in his lap. And as if that weren't enough, a spiritualist of note—one Madame Mazola, who had taken a powder out of the Tyrol in 1915—put out her shingle in Bar-le-Duc. She announced to whomever it might concern that she would give an applicant a clear wire to his relatives who had long since departed this vale of tears. Ectoplasm was her specialty, and it would be produced for the most skeptical—for the

insignificant sum of five francs—payable in advance!

In addition to all this, a big war was still going on in France.

The first sign of astral disturbance hit the Ninth Pursuit Squadron, located on the outskirts of Bar-le-Duc, when Phineas Pinkham moved his belongings out of the hut he shared with Lieutenant Gillis, otherwise known as Bump. The Old Man promptly haled Phineas into the Operations Office and desired to know in no uncertain terms where he had gotten orders to move. Phineas pointed toward the roof.

"I have found out that our destinies are controlled from above," he said solemnly. "I was born in April at sign of Taurus, The Bull! Well, if Taurus and Pisces,

The Fish, are in the same house at this time of year, disaster will fall on The Bull—and that's me, you know. Anyhow, Bump Gillis was born a sucker—I mean under The Fish—an' so . . ."

Major Rufus Garrity got up slowly, his eyes bulging. "What in the name of— Go see a medico, Pinkham! You're off your nut. Taurus, huh? Well, let's have no more of your bull. Get out of here! And start moving back into that Nisson. I give the orders around here, you lame brain, and if you want to really see some stars, just let me know and I'll oblige you!"

"I know my destiny," Phineas

After Madame Mazola hit town with her astrology, it didn't take Phineas "Taurus" Pinkham long to prove that Garrity was a crab, Gillis was a sucker, Goomer was two other guys, and Casey was the goat. But it wasn't until Babette hit Phineas with her skillet that the transplanted star gazer from Boonetown really got his astral plane into the ascendancy. And then he hit into something himself—a double-talk play!

HERE'S ANOTHER ROLLYING "PHINEAS" ROAR

By Joe Archibald

Author of "Happy Hunning Ground," "Skyway Robbery," etc.

With Illustrations by the Author

persisted. "Taurus and Pisces can't stay under one roof. Taurus is on the throne an'—Say, when were you born, Major?"

"July 2 . . . but, you crackpot, what has that got to do with—"

"The Crab! Haw-w-w-w! I should've known it. Well, it's all right for Taurus and Cancer, The Crab, to be under the same roof for awhile. So I will move in here, an'—"

"Over my dead body you will!" Garrity roared. "You make me sick. You give me cramps, Pinkham! Get out of here!"

"There! That proves it!" the C.O.'s tormentor exclaimed. "It says when you are born at the sign of The Crab you are subject to stomach aches. See, it's right in the book. You've got a happy family life, too."

"You're a liar! My wife—" Garrity suddenly jumped up and down on the floor and swore like a mule skinner. "I'll strangle you, you halfwit!" He pawed over his desk for something to throw.

THE CAUSE of it all took a hurried departure. But he did not move his things back into the Nissan he had occupied with Gillis. Instead, he sat on his trunk in the lane outside the row of huts and studied a book he had purchased from Madame Mazola. Then after awhile, he got up and began to canvass Buzzards' Row like a brush salesman. At last he found a pilot who was born under a sign of the Zodiac that was in harmony with Taurus at that particular time of year. The pilot protested, but to no avail. Phineas simply established himself in the new quarters, and then went the rounds, tagging the birthdays of some of his mates.

He now became more convinced than ever that he had finally acquired the right slant on life. Sergeant Casey had come into the world under Capricorn, which means The Goat. And Glad Tidings Goomer's zodiacal rating was Gemini, which means The Twins.

"Haw-w-w-w-w!" Phineas guffawed upon learning of that fact. "I knew that, too. One bum could not be so stupid."

Captain Howell had first seen the light of day when Scorpio was in the ascendancy. "I always thought you were a scorpion, as you're poison to me," Phineas told the flight leader with an enormous grin on his homely freckled face. "It all works out right. I will live my life as the astral C.O. says."

MEANWHILE Madame Mazola was coining *argent* in Bar-le-Duc. There is no more potent sucker bait in the wide world than a medium's crystal ball. Half the pilots on the Allied payroll who worked in that sector trekked to her den to learn of the future and to see how soon they were likely to "go west." A lot of them came away with the jitters.

Citizens of Bar-le-Duc also told of the amazing talents of Mazola. A dozen of them testified to having seen some ectoplasm flutter over their rooftops and disappear into the night. One Frog peasant woman swore that she had talked to her dear departed grandmother. Then again, a seance ordered by some dubious brass hats gave them the scare of their lives. They heard tappings, had a table lifted right out of their laps, and were treated to a cloud of ectoplasm that sailed right out

through a window and up into the evening sky.

That same night, however, Jerry bombers nearly erased a big French general off the map when he was journeying between Revigny and Vaubecourt. So even though spooks were becoming a nuisance in the sector, compared to the trouble that the Heinies were tossing at the Allied brass hats, Madame Mazola's spirits were as harmless as butterflies.

For weeks, the Democrats had sat with many pat hands, their eyes on a cleanup. But when the cards were laid on the jittery table, Jerry tossed in the works and scraped up the kitty. Something was fishy. Gothas bombed a road that was camouflaged better than a piece of buckshot in a barrel of caviar, and they hit just what they figured on hitting—the ammunition train.

Near Mont Sec, Frog and Yankee brain trusters tossed in heavy reinforcements to crack the Jerry line by a surprise attack. For they had been told that the Boche were as weak as starved kittens at that point. But when the brawl started, they found the Krauts thicker than Scotchmen around a free lunch counter—and they were tossed back until the waters of the Meuse River were wetting their empenages.

By this time, Chaumont was convinced that dirty work was abroad. Representatives of the Allied Intelligence Corps began counter-snooping. And in three days' time, they had four hundred citizens ready for lead poisoning. But all of them had good alibis.

As was inevitable, the Chaumont agents now appealed to the Air Force for help. A colonel and a major stopped at the Ninth Pursuit Squadron to make sure of the co-operation of Garrity. They walked into the big living room of the Frog farmhouse just as Phineas Pinkham was complaining about a pain in his neck.

"I knew I was right," the Boonetown, Iowa, astrologer wailed. "It says anybody born under Taurus would have neck trouble. Madame Mazola says I shouldn't go near any place that sounds like it has to do with a bull. Uh—er—I hope I don't ever meet that Kraut bum, Goehring, huh? If I did, I might be Goehred. Haw-w-w!"

"Attention!" the Major of the Ninth roared. "Stand stiff, Pinkham!"

"Anyways my neck will haw-w-w-w!"

"Carry on," the visiting colonel said. "How are you, Major?"

"Fine! Fine!" replied the Old Man. "At least I was until you men got here. Ha! Ha!"

"Ha-a-ah," the brass hat echoed in sickly imitation of mirth. "We haven't bad news, Major. Relax. Just want to have a little chat. Uh—er—what ails that man?" And he stabbed a finger in the direction of Phineas

"I've been framed!" he yowled, as bullets suddenly dug the turf around his feet.



Pinkham who had suddenly ducked out through a window. Lieutenant Gillis was coming through the door.

"Him?" Garrity snorted. "Oh, 'a fish' just came in. This is a bad time of year for a fish and a bull to be under the same roof."

By now, the brass hats had decided everyone was balmy.

Then Glad Tidings Goomer appeared at the kitchen door, scratching at his head. He did not seem to be aware of the presence of the Chaumont detectives, and he spoke to Howell. "I don't git it," he said stupidly. "Lootenant Pinkham says I was born twins, Cap'n. He says I shouldn't ought to go out on Wednesdays, as that's a bad day for Jiminy an' I might git killed. Jiminy crickets! He says to me, did I feel roomertism anywheres this mornin'. It's funny cause I got a sore arm. What do you think he—?"

"Garrity!" the colonel stormed. "Let's get out of here before I go batty, too. I don't know *what* to think about you. But you'd better have these men looked over. Too many hours in the air—nerves probably."

IN THE PRIVACY of the Operations Office, the Intelligence officers told Garrity of the grave situation confronting the Allies. The Heinie spy system had gotten out of hand and reports were drifting across the lines that the Kaiser had established a clearing house for his espionage system much nearer to the war zone than Berlin.

"There's evidence in the back area that the nerve center of the whole works is in Alsace, Major," the brass hat said seriously. "There have been reports of undue activity in one of those places not far from Metz. The location has no military significance. There are no signs of ammunition or supply dumps in that area. Yet a French flyer reports that it is heavily ringed with camouflaged anti-aircraft batteries. Why?"

"You tell me!" Garrity retorted under his breath. "Maybe it's the headquarters of the High Command," he suggested aloud. "That's reason enough to have popguns around it, isn't it?"

"Perhaps. But we've got to be sure, Major. Somebody has got to find out if the Germans have set up a communication center there, and if they have new apparatus—a system of signals. If so, an air raid—"

"I knew it!" the C. O. of the Ninth grumbled. "So you didn't bring bad news, huh? All you want is a solo flyer to go over there and get his pants burned off. Duck soup, Colonel! Simply duck soup! I'll have a victim ready for a spade by tomorrow night. What's the name of that town? Show me on this map."

The colonel pointed. "Right there," he said. "Just north of Metz. The town of Varche. Well, that's all, Garrity. I'll communicate with Wing Headquarters. Just to confirm—"

"Get the undertaker on the phone while you're about it," the Old Man interrupted with a snort. And say, "how'd you happen to think of *us* for this job?"

The Colonel grinned. "Playing a hunch, Garrity. Paid Madame Mazola a visit. She told me nine was my lucky number. So the Ninth Pursuit Squadron was the answer. What's more, this is the ninth of the month, and I was thirty-nine today. Well, we must be going now, Major."

The C. O. dropped his head in his hands and groaned as the brass hats stalked out. He went up to his room and got a bottle out of his trunk. And when he awoke next morning, his mouth tasted like the under side of a rag rug.

The early patrol flyers were polishing off their breakfast prior to taking to the air when the Old Man care-

fully descended the stairs (carefully, so as not to jar his head) and changed the orders he had given "A" Flight the night before.

"I'm giving you a chance to spot somethin' this mornin'—so that one of you fatheads won't have to commit suicide tonight. You patrol the sector near Metz, drop down low over this point here on the map, and keep your eyes peeled. We want to know what's going on there—the place is named Varche. The Intelligence thinks—"

Phineas choked on a piece of toast and shoved his chair back. "What's the name of that town, huh? What did you call it?"

"Varche!" the Major hollered. "Why don't you give your ears a bath?"

"Oh, I can't go *there*!" Phineas argued. "I would get killed. We'd all get washed up. Anybody born under Taurus is out of luck if he goes near a place that sounds like that. 'Varche' is the Frog word for a cow, and a bull is a cow's husband. It's too risky. Anyway, my neck is worse this A. M."

"You go out with the rest!" Garrity roared, "or I'll have you shot for cowardice in the face of the enemy. Just give me half a chance. Get out to that Spad of yours, Pinkham, or—"

"Awright," Phineas gulped. "But you are sendin' me to my doom! My ectoplasm will come back an' haunt you. If I 'go west,' I will find my way back to Madame Mazola's, an'—"

Glad Tidings Goomer came out to clear up empty java cups. "Is it okay for me to go out today, Lootenant?" he asked Phineas. "What does it say in the kodak, zodac, or whatever you call it?"

Major Garrity booted Goomer halfway to the kitchen, then thundered at Howell to get his gang on to the tarmac. In five minutes, five Spads were heading for Boche territory, and in one of them Phineas Pinkham was shakily thumbing his nose at fate against his better judgment. He sensed that Disaster was hiding behind a cloud over Varche with a black-jack in its fist.

Anyhow, Disaster took its first crack at Howell in the form of a Jerry Fokker, and the flight leader's crate went into a tantrum. Then three Fokkers came down off the top shelf and ganged Bump Gillis. Another trio of them headed for the illustrious offspring of the Iowa Pinkhams.

Even though Phineas had taken a running start, bullets fell an inch short of his tail for fully five miles and he got over the lines with a spent bullet tumbling around inside his coat collar.

"I told 'em!" he complained. "No bum can kid with Fate. Mazola was right. An' Bump should not be upstairs with Taurus at the same time. I had better resign, marry Babette, an' go home."

Grumbling and muttering, Phineas Pinkham landed outside of Bar-le-Duc. He got out of the cockpit and started walking across a field toward an open road when suddenly he tripped and fell. He scrambled to his feet and turned to look at the hole in the ground. Something was moving at the bottom of it, and when Phineas bent over he saw that it was a field mouse. It squeaked as he picked it up and stored it in his pocket.

"Fate—that's what it is!" the ardent follower of Madame Mazola chuckled. "I'll name you 'Oswald.' And you'll be good luck."

THE flyer's legs were still shaking when he knocked on the door of his choice of Frog damsels. Babette ushered him in, then tossed her sewing on a table and turned to give all her attention to her Yankee Romeo.

(Continued on page 74)



Snapshots of the War

Some of the better known military planes used by Great Britain during the World War—ships representing four major English aircraft manufacturing companies—are on parade below for our F.A. readers. This striking "gallery" of rare photographs includes the DeHavilland-6 trainer, Parnell Panther, Short Shirl torpedo carrier, and Sopwith's Pup, Triplane, and Camel. Okay, scrapbookers—take 'em away!



One of Britain's most adaptable trainers was this rugged old DeHavilland-6. And you certainly have to admit that she carried enough wire to start a telegraph company! It was her wings, though, that proved the butt of numerous jokes. Air Force boys told us that the airfoils—which were interchangeable—had the boys saying that they were "made by the mile and cut off by the yard." As for that interchangeability (my, what a big word!), that enabled them to replace broken wings easier. They didn't have to manufacture two different kinds. Note the various features of the craft: chisel-like nose, four-bladed prop, hatch-tub-like cockpit, and empennage control wires carried outside the fuselage. (Puglisi photo.)



This was the original fighting triplane—the great favorite of Capt. Roy Collishaw, the noted Canadian ace, who, incidentally is still with the British Air Force, now being a Wing Commander. Sopwith made this "tripe", and it was famed for its climbing speed. But found to be too tricky to land, it was washed out in favor of the Camel. (Puglisi photo.)



Here's the Parnell Panther, one of England's wartime shipboard fighters. That Vee slot in the side of the fuselage indicates where the body folded over to allow more room for stowage. The Panther, by the way, was one of the first jobs to be fitted with what is known today as a flotation gear. (Gordon S. Williams photo.)



Presenting the Sopwith Pup, baby brother of the Sopwith Camel. Fine little ships, they saw plenty of action in '16 and '17. Then finally they were used for training pilots slated for the Camel squadrons. Early models carried the Sopwith-Kauper gun gear; later models were fitted with the Constantinesco firing mechanism. (Puglisi photo.)



German flyers had a view like this when Camels got on their tails. This particular Camel, however, was designed for shipboard work with the early carriers. That's a Lewis gun mounted on the top plane. It was used for firing upward at Zeppelins during North Sea patrol work. (Gordon S. Williams photo.)

Right. Yep, they had torpedo carriers, too, in the Great War! And that's a "live" 1,000-lb. Whitehead torpedo you see here plummeting from one of Great Britain's wartime Short Shirls. Note how the plane's radiator had been mounted high over the cowl, safe from sea spray. (Puglisi photo.)



And Now For Spins!

By George Lyle

Transport Pilot and Flying Instructor

THE LANDING BUGABOO PERSISTS

IT was a bit gusty. Jack Conroy hadn't been bothered by it on the take off. But now on the approach glide for a landing, the ground seemed to sway up at him as the light training plane mildly rocked through the low altitude turbulences. He kept wetting his lips, and his clutch on the stick tightened until the rubber grip felt sweaty to his palm.

As he crossed above the wires at the end of the field, a particularly sharp gust tugged at his left wing and he slammed the control stick hard over to the right. Almost instantly he was aware of restraining pressure being applied through the duals by his instructor, Chet Macklin.

"Easy now, Jack," admonished the veteran through the Gosport. "You're *fighting* the ship, not flying it. No sense in jerkin' the stick out of the socket just because we hit a little bump. Try using a little rudder in connection with the ailerons on those bumps. And for Pete's sake *loosen up!*"

Jack, keeping his eyes glued on the approaching ground, tried hard. But he couldn't achieve the smoothness of movement that comes only through the flexibility of relaxed muscles. Over controlling badly through the last stages of the glide, the harassed student made a jerky premature effort to get the tail down. Thereupon, the ship ballooned and Jack, again over-controlling in trying to level off, drove the wheels into the ground. The plane gave a lurching bounce; and Macklin, forced to take over, straightened her out with a quick blast of the motor and then eased her into the landing himself.

After the plane had rolled to a stop, the instructor twisted around in his seat to face the dejected student. The nervous strain under which young Conroy was working was plainly written in the student's set features and Macklin choked off a sharp criticism to substitute an encouraging:

"Air's sort of choppy today, eh, Jack? Good practice, though. Let's try her again."

"Wait!" Jack cried. "I—I want to talk to you."

The instructor studied him for a moment, then nodded. "Okay. Let's get off the runway first. Taxi her over closer to the fence."

JACK GETS A NEW SLANT

WHEN they were clear of the landing area, Macklin again turned to face his student. "Well—?"

Young Conroy pushed his goggles up on his helmet and drew the back of his hand across his perspiring forehead.

"It's not the air, Mac," he admitted miserably. "It's me. I—I don't know what's the matter. I'm okay until the ground starts coming up at us. I mean, it comes so quick at the very last that I can't help thinking about that crack-up we had. He paused momentarily, then rushed on as if denying an accusation. "No! I'm not afraid, Mac. Honest I'm not. It isn't like being scared. It's just that I get sort of all tight inside . . ." As he finished speaking, he averted his face to await with bitter resignation the verbal flogging he felt sure was coming.

Before saying anything, the veteran pilot dragged off his helmet. "Might as well be comfortable if we're going

to have a pow-wow," he announced with amiability. We'll declare a recess and the time won't be charged to you."

Jack blinked in surprise at Macklin's tone. "Gee! I thought you were going to ball me out," he said with a sheepish little grin.

"I will—if you don't shut that engine off. If we're going to talk, I don't want to have to shout."

The student hurriedly complied.

"You remember, kid," the instructor began in that intimate conversational tone he always used when trying to clear up some particularly troublesome point. "You remember me telling you about the tendency of students to develop a mental hazard in connection with landings. Well, you're getting a good start towards acquiring a beaut! Even this early in the game, you've got yourself pretty well convinced that you're going to be a flop at landings.

"Now, I'm going to be frank with you, Jack. The truth is that so far you *have* been a flop at landings! But that isn't because you haven't the ability. It isn't because you lack vision, judgment, muscular coordination, or sufficiently rapid reflexes. No! Not by a jug full! You've got every inherent qualification needed.

"The trouble is—" And for emphasis the pilot thumped the cowl. "—That damned crack-up!"

"That was a bad break for you, Jack. Naturally, it made an impression on you—a bad one. That can't be helped. But, kid, you've got the wrong slant on it.

You've heard of association of ideas? Well, that's what has happened. In the back of your head, without thinking about it, you've associated that crack-up with landings, and consequently you've developed an aggravated case of 'ground-shyness'."

Young Conroy gave a disconsolate shrug. "I guess that's so, but what else can you expect? We were trying to make a landing when it happened, weren't we?"

"No!" snapped Macklin in sharp contradiction. "It definitely was *not* in landing. When that ship ground looped in front of us, we were *forced* to give up the idea of making a landing. Then it was no longer a problem of setting our plane down; the emergency simply made landing impossible, and we were obliged to choose between barging into that other plane or deliberately cracking up our own. Get that? *Deliberately* cracking up! That was the situation—and we chose the crackup. How, then, can you logically attribute the accident to landing?"

"I never thought of it that way," Jack confessed. Then, brightening a bit, he added, "but I guess you're right. We weren't trying to land when we cracked up at that, were we?"

"Of course not! We were really trying to avoid a plane that was out of control on the ground. Keep thinking of it in that way. Get it etched into your gray matter that the crack-up had nothing to do with attempting to land." Then, as he started to clamber from his cockpit, Macklin added, "Get into *that* frame of mind—and we'll lick the pants off this 'ground shyness'."

TIPS ON TAILSPINS

THE INSTRUCTOR, on the ground now, started for the nose of the plane with the evident intention of re-starting the motor. But he abruptly changed his mind and returned to the side of Jack's cockpit.

"Maybe it would be better," he suggested, "if we laid off landings for the rest of this session in order to give that new slant on the crack-up a chance to soak in. How about some work on spins? How'd you like that?"

LEARN TO FLY WITH JACK CONROY—LESSON NO. 8

"Boy!" ejaculated Conroy. "That'd be great!"

"Okay, then. We'll grab ourselves some altitude and try a few. I'll do a little explaining now, and then do the first spin and recovery when we get up there. You can follow me through on the first one and later try a few for yourself."

"But, say," broke in Conroy. "I've heard a lot about flat spins. Is there much danger of getting in one?"

Macklin shook his head. "Not in any plane carrying an Approved Type Certificate. The Department of Commerce insists on ships having exhaustive spin tests under every conceivable condition. And they refuse to okay any plane which 'acts up' even in a prolonged spin. But let's consider normal spins:

"First, Jack, always remember that a stall is the primary phase of all spins. Air speed must be lost before a spin is possible. The loss of speed may result, as you already know, from several different things—too steep a climb, a skidding turn, too flat a glide, and such things. The point to get into your head is that loss of speed to a stalling point, regardless of cause, is a potential spin.

"Got that? Well, to go on, we know that from a normal stall—that is, a stall wherein both ailerons and rudder are neutral—the ship's tendency is to fall off into a simple dive. But if at the moment of stalling excessive rudder is applied, the dropping nose will swerve to that side and in a second she'll wind up in a spin. She'll continue spinning as long as the stick is held back and the rudder held hard over. To come out of it, you must neutralize the controls. That done, the rotation will cease and the plane will assume the dive position, from which recovery is merely a matter of leveling off."

"That's all easy," commented the student.

"It's all right," affirmed Macklin. "But on the first couple of tries you may be a little disconcerted by the speed of rotation—it seems so much faster when you're in the plane than when merely watching some one else do it. However, although you may never be called upon to use the knowledge, I want to give you the dope on what to do if you're ever in a spin which *cannot* be stopped by simple neutralization of controls. Now listen carefully:

"If a plane continues to spin after controls are placed in a neutral position, the first thing to do is give it full *opposite control*. That means stick hard forward and full outside rudder—you know, rudder opposite the direction of rotation.

"Now, if the plane *still* persists in spinning, throw the stick to the forward inside corner of the cockpit. That's called *cross controlling*. You see, that's outside rudder and inside stick—remembering that 'outside' means toward the *outside* of a turning movement, and 'inside', of course, toward the *inside* of a turning movement. Now is that clear?"

"Outside rudder and inside stick," repeated Jack. "Yes, I've got that all right."

"Good!" said the instructor. Then he went on: "But remember, *never* ease off on the rudder or permit the stick to come back any. Full rudder and full forward pressure on the stick must be maintained even though you do move the stick to the inside.

"Now there are a couple of more things that can be tried in the event the spin still persists. One is blasting

the motor while holding the controls in the position described. If she'll take it, you may be able to throw enough air against the tail surfaces to snap her out of it.

"And finally, if everything I've outlined here fails, loosen your safety belt and *stand up*. Naturally, to do that you've got to hang on like hell. But it can be done. The idea is to lean as far forward as possible, thus shifting the center of gravity toward the nose—for a slight shift of the c.g. is sometimes amazingly effective.

"Then, if that doesn't work, you're in a good position to bail out with your chute. That's the *last* move—the one that exhausts the bag of tricks!"

"Gosh!" breathed young Conroy, a little awed, "I hope I never have to do *that*!"

WATCH FOR THE WARNING!

MACKLIN laughed. "Chances are you won't. As I told you, no approved type of ship has screwy spin characteristics. But even so, I've given you this dope because it's all good to know. Some day you may have a test-pilot job. You may be called on to spin some new ship of unknown characteristics. Then it'll be darned handy to know what to do in case recovery can't be effected by simple neutralization of controls.

"And one thing more, Jack. If it ever becomes necessary to bail out in a spin, don't forget to jump to the *inside* of the spin."

"That seems funny," commented Jack after a moment's thought. "Seems that you really should jump away from the center of the spin."

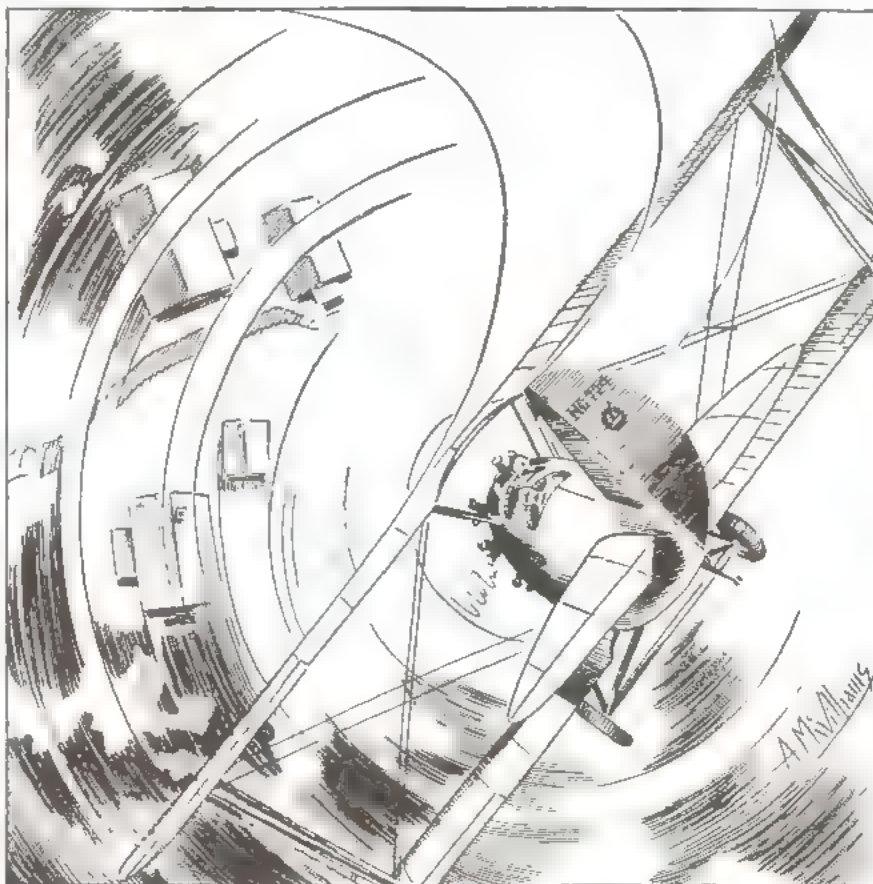
Macklin shook his head emphatically. "Nope! That way, the tail surfaces may sweep into you. But jump to the inside, and they'll swing away from you . . . And now, let's get going!"

"Wait!" cried Jack. "First tell me something about flat spins."

"Well," said Macklin, "there's

(Continued on page 72)

Try as he would, Jack could not make his eyes keep pace with the plane's dizzy revolutions. The whole world was whirling around like a dancin' phonograph record on a mammoth Victrola.



Hurricane Wings

By Arch Whitehouse

Author of "Aces of Iraq," "Fog Flyers' Fate," etc.

Illustrated by Alden McWilliams

THE BLACK BULLET was trapped at last. Kerry Keen knew it, Barney O'Dare knew it—and the gunner aboard the Coast Guard Grumman knew it. For he'd tracked them down on the tip-off of a betrayer.

Yes, the Black Bullet was trapped. And Kerry Keen—the dread Griffon—had never suffered such torment before. He knew bitterly, that they had been "turned in" by the men they'd aided for so many months.

Another blast from the fixed gun of the Grumman J2F-1 amphibian lashed across the faltering nose of the wounded Griffon ship. Keen frantically eased her out, then stared about for something—something that would promise a last fighting chance.

"A swell time to nail us," he growled under his scarlet mask. "How did they ever put this over, and when the devil, Barney, are you going to unship that gun?"

O'Dare, in the back pit, was cursing and struggling with a wrenched and battered gun mounting. The first burst had chopped off one of the dural tubes carrying the slide guides of the device, and it was practically impossible to bring the weapon into action.

The Mick continued profanely to call upon his ancestors to relieve his plight, and there was enough edge on some of his adjectives to clip off a few flying wires. But his cries were futile.

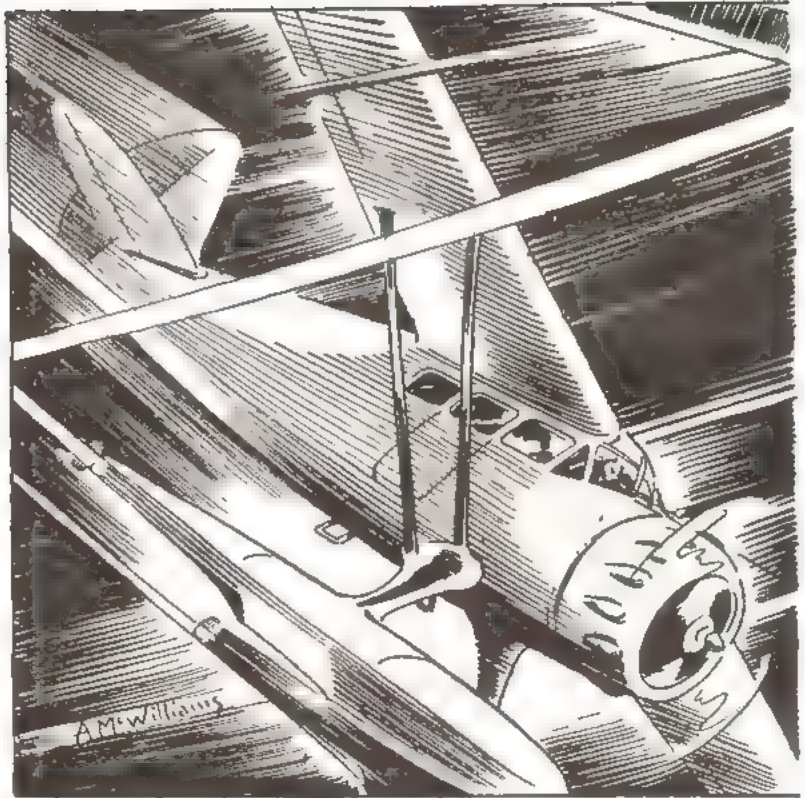
True, Graylands was less than five miles away. But they had been running on a small gravity tank for some time now, and it was obvious that they could never make it.

Keen tried to clear, but the Coast Guard Grumman was out for blood. They had been looking for this Black Bullet guy for months. They had obtained this fast Navy airplane for just such a special occasion as this.

Keen perspired like a man working before a steel furnace. He twisted the Black Bullet again as another torrent of lead passed over his head. Another such shot, and he figured it would be all over.

He tried in vain to get his nose around to trigger a blast across the sky at the Coast Guard craft. But there was no life left in the old bus—not enough, at any rate, to maintain real speed. The Grumman was hitting about 180 net, and the C.G. pilot was pouring gas to her as fast as she could gobble it.

The minutes dragged like



ages as the Bullet's Avia engine gasped and struggled for breath. Then suddenly O'Dare shoved his ugly mug over Keen's shoulder and bawled: "Hey, is it high tide now?"

"You wouldn't like to know who Dartmouth is playing next week, would you?" came the biting reply. "Get that lousy gun out of there and go to work!"

"But I want to know," persisted Barney. "I got an idea."

"Sure, I have one, too—an idea that we'll both end up at Leavenworth breaking rocks. Now get that sling-shot out!"

"It is high tide down there?" queried the Mick, as another blast spat at them, sending thuds along the longerons. "If it is, we're in," Barney chirped. "See that point down there? Try somehow to make that. There's an old cave down there, and we can get into it if there's enough water."

"How do you know?"

"I was down there once looking for treasure—you know, Captain Kidd stuff. We can get in if we fold the wings."

"Okay," agreed Keen. "Now give them 'the business'."

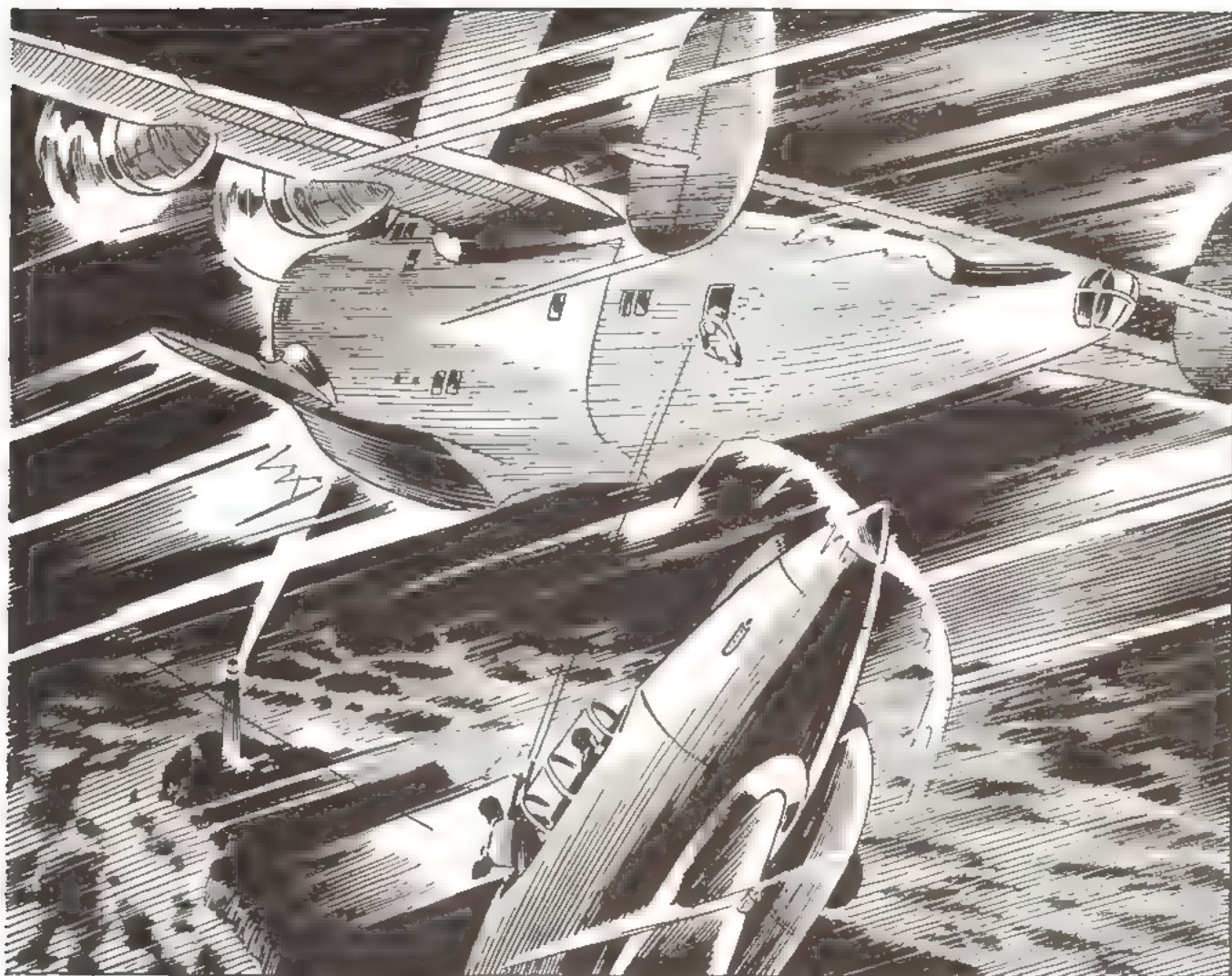
The Grumman was signalling, demanding that they descend and surrender. Keen frisked his tail around, and Barney gave them 'the business'—which consisted in pulling a lever which released a smoke screen that would have blinded half the Navy.

Keen held on to his few ounces of power and cut into a tight spiral, keeping one eye on the point below indicated by Barney. He held on somehow, cutting back and forth across the path of the Grumman amphibian. Then with a sudden swerve he darted back into his smoke path and wriggled the floundering Bullet through the screen until he was certain that he had eluded the C.G. plane at least long enough to try O'Dare's plan.

"Go ahead now! They cut inland somewhere, trying to get around the smoke," said the Mick with confidence.

Keen was still not certain of things. He nursed the Bullet's

Time and tide wait for no man! And now, as a roaring Coast Guard Grumman poured a hail of lead into the crippled Black Bullet, the dread Griffon's time had come! But the magic of the tide was something else again. And when the Griffon sped his ebon amphibian through the dark heavens to prove that dead men can fly, he found that he was matching his guns against the magic of—a length of common thread!



Suddenly swinging his twin guns full on the hull of the Dreadnaught, Barney triggered a lightning blast—and a man toppled across an open port like a stuffed dummy.

throttle some more—and felt her gasp her last breath.
“Don’t lose her now,” pleaded the Mick.

THE BULLET dropped out of the heavy, pungent smoke and headed with a low wail toward the bleak inky shore below. Keen lowered the retractable pontoons for the landing and glide toward the mystery cave which now lay just below and ahead.

The Mick was already clambering out of his parachute and coveralls and preparing to go over the side. Keen watched for the Coast Guard ship, then *swish!* she landed crazily and eased forward into the gloom.

Somehow he maintained enough headway to run her up toward the point the Mick had indicated. Barney clambered out to the wing root, a coiled line in one hand. And Keen saw that there truly was an opening in the rock.

In a few minutes, the Black Bullet was being slowly towed inside the cave, her wings folded back, and her nose being gently guided into the black nothingness.

“How the deuce *did* you find this spot?” Keen asked once they were inside.

“Just wandering along the shore one day. The tide was out then, and I could walk in. But I waited around to see what happened when the tide came in. It leaves you with about four feet of water.”

“Well, we can be plenty glad you spotted this. Listen, those guys are still flipping around out there trying to find us.”

“They never will locate us now. Let’s leave her tied up, with just enough slack to let her touch bottom when the tide goes out again. It’s fairly level underneath. Come on down and try it.”

Keen dropped off the pontoon and touched bottom. The water came up to his middle now. It was cold and he sucked in his breath as he watched the dim outline of the Mick putting on restraining lines.

“Well, nothing to do until tomorrow, Barney. You’ll have to sneak back here then and get her fixed up so we can get her out again tomorrow at high tide.”

“—While you do the gentleman act of buzzing back to the city, huh?”

“Well, Lang said he’d call me later—and surer than sin that’ll mean some kind of a job for us that’ll require checking in town.”

“Is that why you did this test hop tonight—and got caught?”

“There may be something in that, Barney. But let’s get along. How far to home?”

“About three miles—as the starfish walk—along the beach.”

“Let’s go. I’ve got to figure this one out. And we’d better leave our outer clothing here.”

“Might as well. And I suppose you want it all starched and ironed when we get back tomorrow night, huh?”

“And the buttons on,” grinned Keen, as he followed the Mick out of the cave and crawled over the rocks.

● ANOTHER CORKING KERRY KEEN SKY NOVELET ●

THREE MILES of clambering, slipping, and crawling brought them to the trim boundary of Graylands. A paring of moon peeped out of the wispy clouds and brought on a ghost-scene as a background to the night's adventure. Neither had spoken a word all the way back from the cave. Barney, who knew every inch of the footpath along the rocky shore, had automatically taken the lead, and Keen, still pondering on the night's activity, had followed.

They sat on a large flat rock and stared up at the riding lights of the Coast Guard Grumman which still carried out a tedious patrol over the shore of Long Island.

"Some one tipped that lad off," Keen said, fumbling into his breast pocket for his cigarette case. "There's something very smelly in Denmark, Barney."

"Denmark? What about Long Island? Why, this place is beginning to reek of trouble!"

"Anyhow, some one is getting wise to us," Keen persisted. "That lad came right to the spot tonight. And those things don't just happen. How come that bird sat up there directly on our line of flight with his lights off? He must have known something."

"You'll hang around here too long—and get nipped. Then we will wind up in the jug," warned the Mick. "Why don't we buzz off for a while? A little vacation, you know."

"And what if you can't get your O'Doul's Dew where we go?"

"I'll switch to beer, and—Hey! Look!"

The Mick's hand gripped Keen's shoulder, and there was a whole paragraph of warning in the grasp.

Keen dropped his cigarette and whirled about. "What is it?" he cried.

"Look! At our house! Lights going on and off—downstairs!"

They stood there staring. Sure enough, a light flashed on in the study, then went off again. In a moment, another flashed on in the small dining room.

Barney stiffened. "Which way?" he asked quietly without turning his eyes from the house.

"Which way—what?" Keen answered.

"Which way do we run? We gotta lam outa here."

"Come on! I'm going up there to see what's going on. They can't burgle our place."

"Yeah? Well maybe they're looking for us—with a nice rock-pile waiting."

But Keen was on his feet, hurrying toward the lawn of Graylands, his ancestral home and now his base of operations as The Griffon. No one, he was determined, would burgle his property without his doing something about it. But on the other hand—considering what had happened thus far that night—it might not be that simple. There might really be something to Barney's visions of rock piles.

Once their feet touched the thick turf of the lawn, the light in the dining room went off and a lower glow appeared from the main hallway.

"You cover a possible escape from the back while I try to nail him in an approach from the front," ordered Keen, drawing his automatic.

They parted, and Keen waited until Barney was well around the other side. Then he moved to the nearest front window where he could see into his study. He quickly noted that his desk had been ransacked. Books were strewn all over the floor and the furniture moved about unceremoniously.

Hate and bitterness blazed up within Keen. He gripped the automatic until his knuckles showed white. Then he darted back to the front door, carefully inserted his key, and turned it. He pushed the door partly open but did not yet enter.

The light was still on in the hallway, but there was no sign of an intruder. Keen waited a moment, then deliberately started to step inside. He could see the switch plate just inside the doorway, almost within his reach.

BUT as he stepped across the threshold, pushing the door wide open, he heard a click—and the light in the hallway went out! Astounded he hesitated. He had been watching that switch; he had stood within a few feet of it. He had heard it actually click—but there was no one in the hallway to press the black button in!

"Barney!" he called at the top of his voice. "Where are you?"

He reached over, pushed the white button in, and the lights went on again. But who had pressed the black button not ten seconds before?

He charged down the hallway, thundered into his study, and flipped on the switch there, flooding the ransacked room with light.

But there was no one there!

"Barney!" he bawled again.

The Mick now came charging in from somewhere in the back of the house. He was white, and his eyes blazed as he stared at the disorder.

"Did you see him?" roared Keen.

"No—he didn't come out the back."

"But didn't you do something to the lights? They went off in the hall just as I came in."

"W-why you must have done that yourself."

"But I didn't. The lights were on when I opened the door. Then as I started to step in, the switch clicked and they went off."

"And you didn't see the guy?"

"No! I saw nothing—absolutely nothing!"

"Holy Mither O'Moses!" gasped O'Dare.

"Come on. Let's inspect the whole place. The fellow must be here—somewhere. You go upstairs, I'll take the cellar, and then—" But Keen got no further. A roar of an aero engine came from somewhere beyond the boathouse, then they heard the booming thud of pontoons skimming across the gentle rollers.

"There he goes!" the O'Dare moaned. "Pulling a 'Griffon' on us, eh?"

They both ran outside and hurried to the boathouse just in time to see the retreating outline of a Stinson Reliant fitted with Edo floats.

"Well, that's that!" Keen observed as the high-wing monoplane disappeared into the filmy mist to the southwest. "Well—let's go in again."



THEY walked back together in silence and entered the house again. And the telephone bell rang just as they closed the front door. Keen with a weary stride crossed the room, kicked a few books and boxes out of his way, dropped into his desk chair, and picked up the receiver.

"Keen speaking," he said.

"Well! Well!" came the voice at the other end. "So the great Kerry Keen is sitting quietly at home for a change?"

It was Drury Lang, Keen's Secret Service headache.

"Yes, quietly in front of my cheery fire," cracked Keen, "with carpet slippers, a good book, and the ever-present Barney to keep the grog glasses steaming. And how's

the world's worst detective?"

"Well, you can pull out of that comfy chair of yours and listen to me, Mister Cheese Importer. Do you like ghost stories?"

Keen gave a gasp. He knew well enough that Lang suspected that he'd recently smuggled certain aero parts through in large cheeses. But this 'ghost' crack . . . ?

"What do you mean?" he said with a knowing glance toward the Mick.

"Well, I told you I'd call, and I got a beaut for you this time. Do you know anything about bullets that will shoot a ghost? You're the big ballistics expert of these parts, aren't you?"

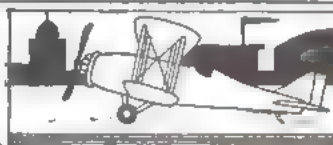
"A ghost?" queried Keen. "What the deuce are you talking about?"

"I'm talking about the fact that they've got a ghost aboard the new Dalton Dreadnaught. You know all about

(Continued on page 61)

HAPPY LANDINGS

BY ARCH WHITEHOUSE



Those Nazis *Wish* They Had 9,000 War Planes!

• • •

AVIATION is a somewhat complex and mysterious business. It is very hard to get figures on any phase of the industry—I mean, figures that are worth the paper they are printed on.

Passenger statistics, air-miles, speeds, express poundage, miles-per fatality, *ad infinitum*, are poured through the public prints until the poor "man in the street" is blinded by what almost seems like an explosion in an adding machine factory. And the calculators seem to prefer complications instead of simplicity.

Performance figures on this or that plane usually mean very little. They are often jacked up—or down—for a specific purpose. The idea is either to sell them or to conceal their true performance. We have learned by now, too, that often when the hush-hush secrecy stuff is on the heaviest, that's when the ship in question has not come up to full expectations.

Probably the greatest hoax in all aviation history, however, is the concentrated effort by certain groups in America (and also in other countries) to frighten the citizens to death with lurid stories of the new German Air Force. Nothing quite like it has been put over for years. And strange to relate, few experts seem to have courage enough to expose these loudly trumpeted inaccuracies.

Ever since Hitler first tore up the Treaty of Versailles, some three years ago, we have been deluged with gaudy articles and features on the strength of the new Nazi air arm. It all started out with a flurry of pictures showing ancient 90-h.p. Klemm low-wing monoplanes in what was supposed to be fighting formation. These photos, believe it or not, were actually captioned, "First Pictures of Monster German Air Fleet."

Then, later on, the wily Teutons daubed up a few old Junkers bombers—which had been turned down in the Scandinavian market—and the Nazi air strength took on almost astronomical proportions! After that, startling figures became common. And during the recent Czech crisis, one "noted aeronautical authority" had the audacity to state that the German Air Force was composed of fully 9,000 fighting planes!

But let's disperse this buncombe with the spotlight of cold reason—

In the first place, Germany's *actual* war-plane strength is only about 700 military planes and approximately 2,000 other types. The military planes run from

light primary trainers up to converted transports. What's the authority for my figures? Well, I dug my data from one of the most reliable sources—*Whittaker's Almanac for 1938*, a recognized authority relating to figures on foreign governments.

Furthermore, I have been in communication with military aero experts who have actually visited *many* German air fields and training stations—not just one or two. These authorities, through World War connections, have been able to contact their old foes on a common ground. Their visits have been open and above board; and they, to a man, declare that the press-story strength of the German Air Force is one of the greatest hoaxes of our time.

Sane observers who know the background of building an air force know that it would be impossible for any country in the world to build and put into active service even 2,000 military planes in a period of three years. The United States, with ideal geographical and climatic conditions for turning out well-trained military pilots, has a tough time obtaining and training 300 service men a year.

Where could Germany—or any other nation—get 9,000 planes and pilots in three years? You tell me!

It takes at least five years to design, build, and test a first-line military plane. It took more than that to develop the "Flying Fortress," and so far the United

States has but eighteen of them in service. It took almost as long to develop the Seversky Fighter, and only enough for two squadrons have been turned out. In fact, if the truth be known, they are not fully commissioned yet.

Meanwhile, the frightening story of Germany's startling new air power rises to new crescendos with the views of other experts—from Lindbergh on down

played up on the front pages of our newspapers. Well, from the diametrically differing reports that have been given out, we're confused as to whether Lindbergh did make, or didn't make, a statement that Hitler's battle planes could lick the whole civilized world put together, including Patagonia. And if he did, whether it was at Lady Astor's tea party or at the corner hamburger stand. But, when checked against the *real* facts, all that doesn't matter.

The basis of the ballyhoo has been built on the fact that a souped-up Messerschmitt 109-M has been clocked at something like 397 m.p.h. But no publicity

(Continued on page 79)

Aero Book Reviews

"GETTING A JOB IN AVIATION"

IF I could have placed my hands on *Getting A Job in Aviation*—the new aviation volume by Carl Norcross—ten years ago, I am quite sure I would have been able to do more justice to some 10,000 queries which air-minded fellows have flung at me in the past.

This book deals with the aero job question in top-notch fashion. Yes, it's one of the best things that has come to my desk!

In frank style, it discusses your chances of getting work in this ever-growing business. It tells about every kind of job available, how to go about "breaking in," and what salary you may expect to draw. It's worth much more than its \$2.50 price just for the information and advice it offers in the matter of training. And pertinent details are included regarding both flying and ground jobs.

Men and women who contemplate following this industry certainly should read *Getting A Job in Aviation*. It's published by the McGraw-Hill Book Company, 330 West

(Continued on page 79)

On the Light Plane Tarmac

Beware of the Gyp Plane Salesman!

"No Feeling More Glorious!"

BEWARE OF THE GYP PLANE SALESMAN!

FOR YEARS, we've claimed that the light plane industry will never get anywhere until it takes a few lessons from the auto field. We have, for example, suggested that the plane makers observe how auto dealers have worked, how the motor car industry developed mass production to bring prices down, and how interest was created in automobiling by organizing week-end rallies, economy runs, scenic tours, and a dozen other schemes to encourage the horse and buggy men to take a chance on the Fearless Four or Chummy Chugger.

All Okay, too!

But we now discover that some of our plane salesmen are getting *too* good at taking tips from the auto boys. For some of them are going off on a tangent by picking up all the *trick* line of gab made famous by unworthy car salesmen. Indeed, a few are adding some cheap, low-down sales gags of their own. And unless someone checks them soon, we'll need an aeronautical Judge Landis to put them back in line—and keep them there!

In short, we have a growing fear that our aero salesmen will try to go the gyp auto salesmen one, or two, better, now that F. A. and the rest of the sky mags with the welfare of the makers and buyers in mind have promoted something of a demand for light planes, both new and second-hand. And meanwhile, we can thank our lucky stars that we have strong Government supervision of aviation; for heaven only knows what kind of crates we'd be sold if it wasn't for that business of Airworthiness Certificates.

Here's one case of what we mean—

A friend of ours—a former war-time pilot—took his first airplane flight since the Armistice the other day, flying in a passenger job from Newark to Boston on business. And he was so sold on the game again that he quickly grabbed the opportunity of taking a trial hop in one of our better known light planes.

Sensibly, the pilot let him take over the controls in the air, and our friend was amazed at how easy it flew as compared with the old Jennys and D.H.'s. His touch

soon came back, and he actually made a couple of take-offs and landings.

Then he realized that during a period of about three months every summer he has the opportunity of commuting from his Jersey home to a point in Maine—roughly an airline distance of 325 miles, as against some 400 miles by auto.

Anyhow, after brushing up with some flying lessons, he planned to purchase a certain plane quoted at a bargain price that meant a saving of several hundred dollars. At this time, he consulted us.

"You see," he explained, "if I get this plane, I can fly from the small airport near my home and be in Maine in about three hours—whereas it takes a whole day by car. I'll get there fresh and clean and have most of a full day ahead for business. I'll be making the trip about once a week."

"But don't you think you'll need a plane with greater range and power if you expect to do a 300-mile hop regularly?" we queried.

"Well," he replied, "this salesman says that if I take what they call the 'golf course' route up that way—that is to say, follow a series of golf courses for safety—I won't have to cover much more than 400 miles."

"Four hundred miles in four hours in *that* plane?" we asked.

"Sure, she does about 90 m.p.h., doesn't she?"

"Maybe when new. But you wouldn't be flying at full throttle all the way, would you?"

"Well, no. But I thought—"

"Had you figured on stops for refuelling?" we broke in.

"Refuelling? Why she can do 400 miles on a full tank, can't she? I took that for granted."

"But the performance figures on that ship says her range is 250 miles at cruising," we explained, amazed at his lack of knowledge in the matter.

"All right," he agreed mournfully. "Then I'll have to plan to make one stop, say at Boston. But I had figured on going right through."

YOU SEE, this fellow had completely forgotten the old law that an aero engine consumes half a pint of fuel per horsepower per hour, or thereabouts. The engine of his prospective ship would consume three gallons per hour at cruising speed, and his tank would hold no more than ten gallons. Thus we figured his actual range at cruising speed to be something around three hours, or 270 miles. But that would be in *still* air. If he ran into any sort of headwind, it would be considerably lower.

The point is, that the salesman has not attempted to straighten him out on any of these points. Which amounts to a gyp by omission of the real facts.

Anyway, we told him about the possibility of headwinds and then came out flatfooted and said that if he really considered such a flight on anything like a regular schedule—and it will have to be regular, if we know anything about his business—he would be wiser in considering a ship with more power, longer range, and a fair amount of reliable avigation instruments, which to our mind includes a radio for weather data.

We are afraid our suggestions were not well taken. But we felt we ought to tell him.

The moral is that every prospective plane buyer must be alert today to see that aircraft salesmen are not trying to put anything over in the

(Continued on page 78)



Our Air Corps, we hear, is quite interested in this sleek new Clark F-40-A light job. Especially noteworthy is its pressed plywood and Bakelite moulded fuselage, formed in halves and bolted together in a process which takes but 36 hours. A 420-h.p. 12-cylinder inverted Vee Ranger engine powers the craft, giving it a top speed of 180 m.p.h. Five are accommodated—a pilot and four passengers—and a 100-gal. tank is an added feature. The Fairchild plant at Hagerstown, Md., turns out the ship.



WISECRACK-UPS



Taxi in on this runway and pick up a plane load of laughs! In this department, we present a collection of jokes, cartoons, and humorous verse. For all original contributions which we can use here, FLYING ACES will pay \$1. Contributions cannot be returned. Address all letters to WISECRACK-UPS.



"We're outa parachutes, lady, but I can let you have a pair of rubber heels."

QUITE LOGICAL

Major (reading report): What's the idea of saying here that Lieutenant Smith died a *natural* death? You know as well as I do that he was killed in a crack-up.

Recording Officer: That's just it, Major. His rudder collapsed, his engine blew up, his wings fell off, and he smacked into the earth. So I say that if he hadn't o' died it would've been *UN*natural!

PRACTICAL IDEA

Rufe: Ya say that bottle of water is one of your flyin' instruments?

Goof: Yeah, it's my Upsidedownometer. When I can't see the earth, I jus' pour the water into my pants. An' if the water runs down my neck—then I know I'm flyin' upside down!

EASILY SOLVED

Bump: But I tell you I need a de-icer for my plane. What can I do about it?

Phineas: You can go to hell! Haw-w-w-w!

Dumb Dora figures that the air is so rare in the stratosphere that the pilots who fight there in the next war will find themselves in the thin of the battle.

HELPFUL

Pilot: Holy smoke! Our tail-trimming gear is busted!

Little boy passenger: Oh, that's all right, fella. I'll lend ya my jack knife.

KER-CHOO!

Greaseball: Poor Bill! He died o' hay fever.

Flyer: Died of hay fever? Whatya mean?

Greaseball: Just as he was comin' in for a landin' in his Flyin' Flea—he sneezed!

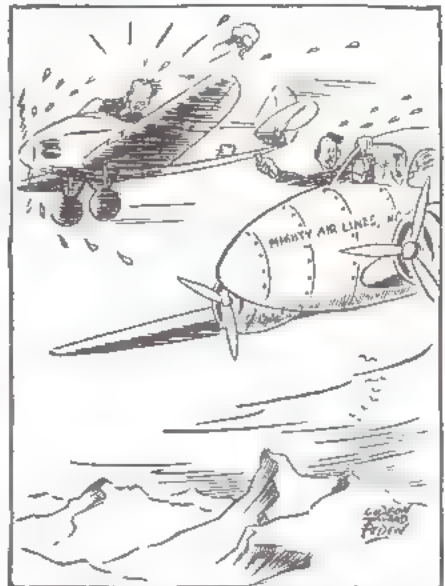
FROM THE MODEL BUILDER'S HANDBOOK

- 1—Models don't land. They hit.
- 2—The beginner will have no difficulty in getting his model to perform the colorful maneuver known as the vertical dive.
- 3—There is a magnetic effect if a model gets within ten yards of a tree.
- 4—Cats and dogs—even though they are dumb animals—have often been known to develop deep interests in models. Indeed, the flying characteristics of many small craft have been profoundly affected due to the ardor of these furred friends of man.

ANOTHER KID GONE WRONG

Mother: Good heavens! You've got all the feathers out of my best pillows!

Little Johnny: But, Mom—I need 'em to make a full feathering prop for my model airplane!



Co-pilot of transport: "Lucky this guy came along just as our motors quit!"

WHITTLED AWAY

Sergeant Casey (to new pilot): And here is the Spad flown by our famous Ace, Lieutenant Pinkham. He carves a notch on his machine gun grip every time he shoots down a Kraut.

New pilot: Quit yer kiddin'. There ain't a mark on it.

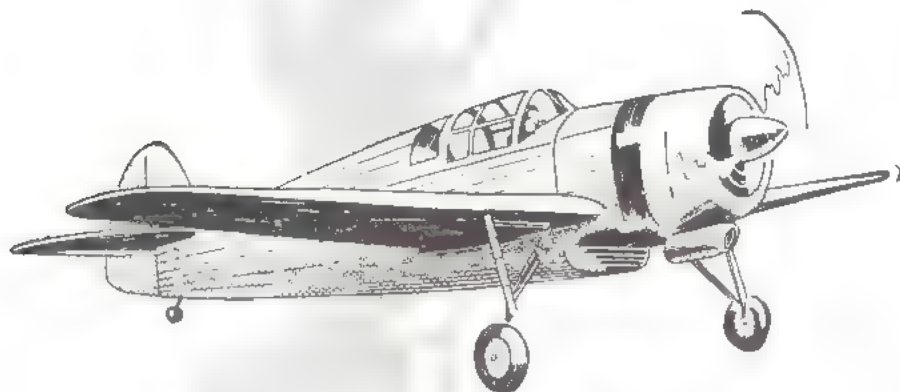
Casey: Yeah, but that's because we just put this grip on. He's gotta have a new one *every week*!

GET IT?

The Queensland Crank, one of our Aussie readers, has come to the conclusion that "The face that launched a thousand ships" must have been Pan American.



Modern Planes Album



KOOLHOVEN F.K.58 FIGHTER,

THE KOOLHOVEN F. K. 58

THIS Koolhoven man in Holland is certainly turning out some amazing equipment for the Royal Dutch Air Force! Last month we presented his F.K.52 two-seater fighter in this department, and this trip we offer his latest production, a single-place fighter using the 1,080-h.p. Hisso radial.

This plane, incidentally, has been offered for sale to the French government; indeed, a few are already being tried out at the French military test park at Villacoublay, and there is a big possibility that the Tricolor will order a considerable number to help build up its air service.

The F.K.58 has a top speed of 300 m.p.h. at 14,740 feet, and it cruises at

268. Her stalling speed with flaps is 76 m.p.h., which seems particularly high for such a plane.

In general, the F.K.58 is of composite construction. The wing—featuring two box-spars, three-ply ribs, and Bakelite stressed skin covering—and retractable undercarriage form one independent unit, which is attached to the fuselage by four bolts. Split aerodynamically-balanced flaps are fitted, and there is space under the wing for a long range fuel tank or a light rack of bombs.

The fuselage, of welded steel tube construction, is covered from the engine to the back of the pilot's cockpit with sheet metal; but from that point aft, fabric covering is used. The undercarriage is built in two independent halves, and the gilled engine cowl is so designed that it provides a fairing for the wheels when they are retracted. Koolhoven shock absorbers and Dunlop wheels and brakes are standard equipment. A wooden tailplane and fin are used, but the elevators and rudders are built on a metal frame.

The equipment includes four fixed machine guns mounted in the wings outside the prop. They are fired by hydraulic gear.

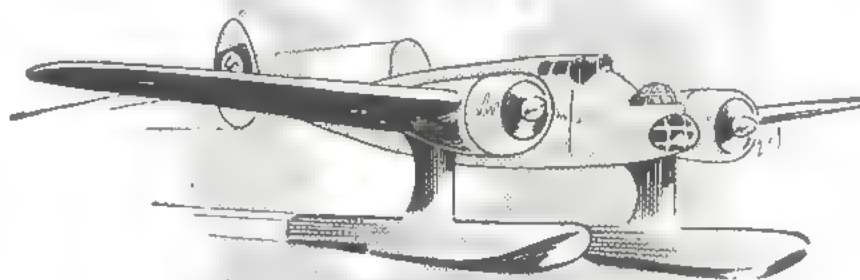
THE BLOHM & VOSS HA.140

A NEW German aeronautical firm has now come to the fore—Blohm & Voss, but which is really the former Hamburger Flugzeugbau firm of Hamburg.

This outfit has built several trans-ocean flying boats designed for catapulting, and this latest product is a military job set on twin floats. Listed as a general-purpose craft, the Ha.140 can be used as a torpedo carrier, a bomber, or a long-range reconnaissance ship.

It uses a cantilever mid-wing of all-metal construction, and power is supplied by two 800-h.p. B.M.W. 132 nine-cylindered radials mounted in the root portions. Top speed is 199 m.p.h., cruising speed 183, normal range 715 miles, and maximum range (with special tankage) 1,553 miles.

An interesting feature of all the Ha. ships is the incorporation in the wing structure of a large tubular spar of welded steel, which passes through the fuselage. This hollow spar "doubles" as a fuel tank. The leading and trailing edges of the wing are detachable light metal assemblies, so that all controls are easi-



BLOHM & VOSS HA.140

ly accessible. The outer panels of the airfoils, trapezoidal in shape, are carried on conical duralumin additions to the main tubular spar.

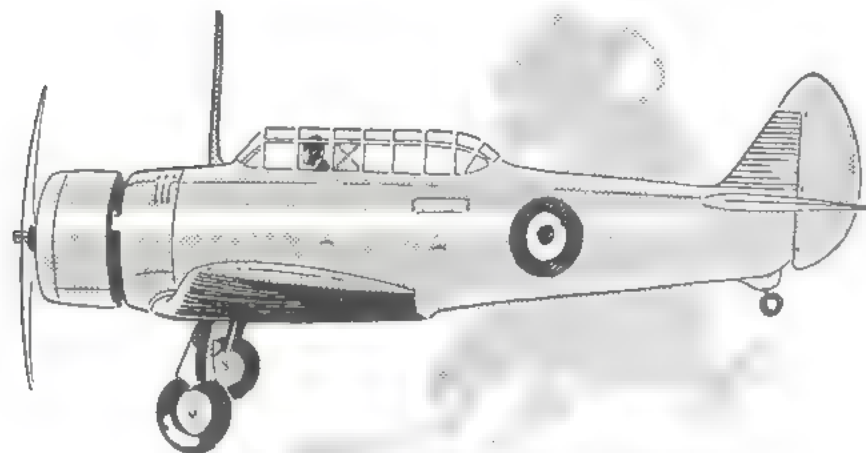
Aileron control embodies a new rotary system whereby movements of the wheel are transmitted to rotating shafts geared to the ailerons. The flaps are electrically depressed

to any desired pre-selected position.

There are two gun positions, one set in a revolving turret in the nose and the other aft of the main bomb compartment. The torpedo or bomb loads are covered during flight by retractable shutters. These also offer protection from spray during take-offs of the trim warplane.

THREE NEW WAR JOBS AND AN OCEAN TRANSPORT

Just off the foreign production lines, these striking craft include a Dutch fighter designed for the French, a Nazi torpedo-bomber, an Australian general-purpose military plane, and Lufthansa's latest trans-Atlantic flying boat.



AUSTRALIAN WIRRAWAY

THE AUSTRALIAN WIRRAWAY
A MERICAN READERS who know their airplanes will quickly recognize in this new Australian military job certain familiar lines and characteristics.

It's called the Wirraway general-purpose machine, and it is now being produced at the Commonwealth Aircraft Corporation. Actually, the

Wirraway is the Australian version of our North American company all-around model. About one hundred of these craft are in production under license, and they are basically like the N.A.'s purchased by the British Air Ministry some time ago.

In this Australian ship, which will carry a retractable landing gear, they use the 550-h.p. geared Wasp engine

which has been built for British screw threads. Also, instead of American Browning guns, they have fitted two fixed British Vickers Mark V guns, which are more familiar to Australians. These are synchronized to fire through the prop. Also, there is a movable "speed-mounting" gun for the observer. In addition, there is a bomb rack below the fuselage, and full radio equipment is carried.

The Wirraway will be employed for dive bombing, Army cooperation work, and to a lesser degree as a fighter. The Australians frankly do not consider it a first-line or "super" plane, but it is said that they do believe it to be a most suitable type around which to build a sound fighting service.

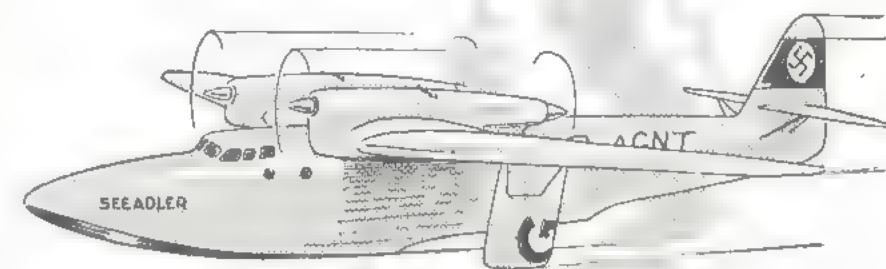
In general, it is a two-seater, general-purpose machine plane with all-metal, cantilever wings. The fuselage, built of welded chrome-molybdenum steel-tube framework with fittings integrally welded, consists of four sections: engine mounting, control section, tail section, and monocoque bottom aft of the wing. All these portions are bolted together.

THE DORNIER DO. 26
GERMANY continues to design planes for the trans-Atlantic runs, and every firm in the Reich seems to be intent on developing new planes for catapulting from a mother ship. The very latest craft is the Dornier Do.26 flying boat, which has a top speed of 208 m.p.h., a cruising rate of 192, and a range of 5,600 miles after a catapult start. It weighs 44,092 lbs. on the take-off cradle.

One of the most interesting features of this ship is the system by which wing pontoons are retracting on this craft. While the retracting floats on our Consolidated flying boats fold upward and outward to become wingtips, in the Do.26 the pontoons retract upward and inward into the outboard engine nacelles.

The Do.26 uses four water-cooled Junkers Jumo Diesel engines. They are set into the shoulders of the gull-wing. Lateral sponsons, so long a feature of Dornier boats, have been eliminated.

The wing, trapezoidal in shape with rounded tips, is built in three sections, the center one being the Vee-shaped portion built integral with the hull, through which all four



DORNIER DO.26.

engines are accessible in flight. The hull is of the two-step type and is divided into eight water-tight compartments. Aft of the bow mooring compartment is a hold for mail and freight, then come accommodations for a crew of four, including the wireless and aviation rooms, and finally a second mail room.

This machine will be operated by Lufthansa. From a catapult launch-

ing, it could carry four passengers and a ton of mail from Europe to New York.

Incidentally, we wish to point out that the strange black curly-cue which appears on the pontoon in the sketch above is only a clipped-off letter "G."

It forms part of the under-wing registration lettering after the pontoons have been fully retracted.

JOIN THE FLYING ACES CLUB

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Official Charters

FAC Flights and Squadrons are recognized at GHQ only after they have received their official charters. These illustrated documents, printed on fine paper and portraying various features in the field of aviation, are excellent for framing and display. Their inspirational text is in keeping with the high ideals and aims of our Club. Each charter application must include a full list of proposed group members and their addresses. Each of these members must hold his regular FAC card, obtained by clipping and sending in the membership coupon printed on this page. If applications are approved Flight Charters are issued for 25c, and Squadron Charters for 50c. Send the correct fee with your application. It will be returned if the Charter is not granted.

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CADET OR PILOT
insignia of the F.A.C.



All members with Official Membership Cards are eligible for Cadet Wings. This coupon, with two others and 10c, entitles members to Cadet Wings. Do not send this coupon alone. Save it until you have three. Then send them in, together with a self-addressed envelope and 10c to cover cost of wrapping and mailing.



All enrolled members who have won their Cadet Wings are eligible for Pilot's Wings. This coupon, with four others and 10c, entitles Cadets to Pilot's Wings. Do not send this coupon alone. Save it until you have five. Then send them all together with a self-addressed envelope and 10c to cover cost of mailing.

Send the Whole Coupon

regardless of which kind of wings you wish. Separate sets of coupons are needed for each insignia. Canadians send 15c, or three International Reply Coupons. Overseas readers send 1/-, or five Reply Coupons secured at the Post Office. Only one pair of either kind of wings to a member. If yours are lost, send 25c for new ones (2/- overseas). [19]

Do Your Full Share to Advance Aviation

TO advance the cause of aviation, over 50,000 men and women, boys and girls, have banded together to form the FLYING ACES CLUB.

It is the easiest club in the world to join. Just clip the membership coupon, fill out, and mail it to GHQ with a stamped, self-addressed envelope. Your official card will then be forwarded to you. After joining, you can quickly win promotion and the right to wear the various insignia of the Club.

In the FLYING ACES CLUB there are two kinds of local organizations, known respectively as Squadrons and Flights. A Squadron must have eighteen members, including its leader. A Flight must have a total of six. You can start either of these groups in your own community by enrolling your friends in the Club, then applying for an official charter as detailed in the column at the left. Each member must hold an F.A.C. card.

Meetings and activities are conducted among the squadrons and flights according to the wishes of the members. GHQ has established no rulings in this respect, nor are there any dues or red tape whatsoever. The entire idea of the Club is a common meeting ground in an international organization for the lovers of aviation in its various phases. Many local Squadrons and Flights hold regular contests and public events. Many hold weekly meetings for model building, and instruction, and even regular flight training.

Awards and Escadrille

After the membership card, and Cadet and Pilot's wings, comes the Ace's Star. This is awarded for enrolling five new members, using, of course, a separate coupon for each. As an Ace, you are then eligible for membership in the FLYING ACES ESCADRILLE. Then you may win truly handsome awards. Among these are the Distinguished Service Medal and the Medal of Honor, two of the finest decorations that have ever been designed.

Any member who has reached the rank of Ace is eligible for membership in the FLYING ACES ESCADRILLE, an advanced organization which replaces the old G-2 unit and opens the way for participation in a definite program contributing to the forward movement of aviation.

To enroll, an Ace must apply direct to Escadrille Headquarters, giving his name, age, address, rank, and highest award already won in the Club, and enclosing a stamped, addressed return envelope. If he is approved for membership his instructions will be forwarded. Membership in the Escadrille is limited to American and Canadian members only, at present.

Special Service!

This Aviator's Positive Identification Bracelet



Registration and Bracelet Only 25c!

A valuable identification service for FAC members is now offered with our World War type aviator's bracelet. Every one now issued will bear a serial number which is the key to your confidential identification record on file at GHQ. In emergencies where prompt identification is needed, this number may be sent to GHQ and identification facts will then be furnished. When ordering send your name, address, occupation and full physical description—age, height, weight, color of eyes, hair and complexion, etc., together with name and address of nearest kin. Overseas readers may receive bracelets and be registered for 2/- in coins or Int. Money Order for same amount.

Keepers of the Log

In order to keep in touch with GHQ, every squadron should appoint a member with a facility for writing as Keeper of the Log. It shall be the duty of the Keeper of the Log to send in regular reports of interesting doings of his squadron. His is an important job, because it is only by means of interesting squadron reports that life can be given to the Flying Aces Club News.

Photographs, too, are an important consideration for the Keeper of the Log. Either the Keeper himself, or any other member with a camera, should keep a photographic record of the squadron's activities, for reference purposes, to show prospective new members, and to allow a selection of pictures to be sent to GHQ for reproduction in the Club News.

The cost of film, prints, etc., would be a legitimate charge against the squadron's own treasury or could be covered by members' contributions. A number of flights and squadrons, incidentally, send us prints which have been taken, and completely developed and printed by members.

Correspondence

In all correspondence with GHQ where a reply is desired, enclose a stamped, self-addressed return envelope with your letter. GHQ receives thousands of letters weekly, and cannot undertake to answer those who do not heed this rule.

Official Supplies

Due to popular request, we have ordered a new supply of F.A.C. stationery and official F.A.C. (paper) pennants. The stationery is of high quality with the Flying Aces Club letterhead attractively hand lettered, and the price is amazingly low. 100 sheets, postpaid for 25c. The attractive pennants (with glue on the back) sell at 6 for 10c or 20 for 25c.

We also have a new supply of swell embroidered wing insignia for cap and sweater. They're available at 35c per pair, or 25c for the sweater emblem and 15c for the smaller one for the cap.

(Overseas prices: Stationery, 100 sheets for 2/-; pennants, 20 for 2/-; wing insignia, pair, 2/-, large emblem 1/8, small emblem 1/-.)

January Membership Application

I, the undersigned, hereby make application for membership in the Flying Aces Club, I agree to abide by its rules and regulations, to foster the growth and development of aviation and co-operation with all other members in the work of spreading aviation information, building up confidence.

I wish to build up the Club and its activities. The Flying Aces Club offers:

My name is _____
Age _____
Street _____
City _____ State _____

Do you build models?
Mail this application enclosing a self-addressed, stamped envelope, a Canadian and overseas readers send the application self-addressed and stamped at the Post Office.

FLYING ACES CLUB, 67 W. 44th St., New York

Flying Aces Club News

By Clint Randall

National Adjutant

Flying Aces Club

HERE, Clubsters, is what many of you have been eagerly awaiting—the latest list of Flying Aces Club awards! All of the winners this time, incidentally, are members of the Flying Aces Escadrille:

Bill Armstrong, of Toronto, Canada; Wally Bickmire, of St. Marys, Pa.; Margretta Buchanan, of Alliance, Ohio; Clint "The Eagle" Burhans, Jr., of Skaneateles, N. Y.; Eddie Fetner, of Columbia, S. C.; Bernard Revering, of Perham, Minn.; and Ross Smyth, of Toronto.

To these members go our heartiest congratulations. For not only have they *professed* a desire to advance the cause of aviation, but they've actually rolled up their sleeves and *done* something about it!

For instance, so interesting have been young Bernard Revering's essays on aviation—written for his high school English class—that his teacher has had them published in the Perham newspapers, thereby adding to the public's knowledge of aeronautics. Likewise, many models made by Bernard have been displayed at school, from time to time, and the result has been an increased interest in model building.

Whenever an aviation question comes up in Bernard's school, Bernard is the lad whose answer is taken as the final word. And the fact that his answers are usually smack-dab correct has been emphatically demonstrated in his completed Escadrille assignments.

And so to Bernard Revering we've forwarded a set of silk embroidered F.A.C. insignias as his first Flying Aces Escadrille award. To the others, whose work has been equally outstanding, awards have been sent as follows: Insignia sets to Fetner, Burhans, and Armstrong; to Bickmire and Smyth, "first props" for the F.A.C. Distinguished Service Medals, with which they had already been decorated; and to Margretta Buchanan, her second D.S.M. prop.

Other members of the Club came mighty close to winning awards this month, many of them missing by only a few points. So step on it, all of you—and particularly you Escadrillions—and let's see if we can't print *your* names in next month's Club News. And remember—those of you who are not yet in the Escadrille—that the chief requisite for membership in this organization is that you be an Ace in the Flying Aces Club (for full details on this, re-read the instructions on our "Join the Club" page).

AND NOW to the "regular" Club news. Up from Puerto Rico this month comes a request for a new Squadron charter; and since the General Staff of the Flying Aces Club has unanimously approved it, the charter has been issued—for "Puerto Rico Squadron No. 1, F.A.C., of San Juan."

Felix Montanez-Matheu is skipper of this new organization, and the current membership list includes: Jose Perez, Eduardo Ernouf, Rafael Diaz, Mario Gonzalez, Erick Iglesias, Erial Ramos, Manuel Correias, Jose Torres, Leopoldo Lugo, Miguel del Toro, Guillermo Fernandez, Victor Gonzalez, Ramon Perez, Ernensto Perez, Pedro La Costa, Miguel Manzano, and Ruben Diaz.

And now, fellows, listen to this bit of business about one of our Clubsters who's dubbed himself

This month, fans, the latest winners of awards in the Flying Aces Escadrille get the "play" in our news. And rightly so—for these are the first winners we've announced in several months! But you'll find plenty of additional Club dope, too, what with a new squadron in Puerto Rico, the eerie ideas of Erie's "Phantom Ace," and the like. So "take it away," Clubsters—it's all yours!

the *Phantom Ace*! The P.A. is a lad who lives in Erie, Pa. So we really ought to call him the *Eerie Phantom Ace*!

Anyhoo, this lad doesn't want us to tell his name or give you his address—for he hankers to be real phantomish. Even his Squadron members won't recognize him, sez he, when they see him without his mask! And for trips to airports and similar places, he plans on wearing a costume that'll completely cover him, face and all.

Now whaddya think of that?

As for Clint Randall, he sorta feels that in the grand old aviation game, there's no need for hidin' one's pan a la K.K.K. Huh? Or huh! What do you say, gang?

Bill Chisholm, of Granite Falls, Wash., asks a question that has been asked several times before. And for the benefit of all of you, I'm answering it here. When a fellow is signing up his five new members in order to become an Ace, it is *not* absolutely essential that all five coupons be from the current month's issues of F.A. The General Staff does desire, however, that the coupons come from *recent* issues of the magazine, the idea being that new coupons show that a fellow's up-to-date with the rest of us—shows that he's keeping step, through our Club mag, with the latest aero doings. This same rule also applies to coupons sent in for pilots' and cadets' wings.

REMEMBER the F.A. "Zoo", composed of Clubsters with animal and bird names? Well, here's a new "candidate" for membership—he's the *Crimson Cockerel*—Edwin De LaRoi, of Bloomfield, Nebraska. And the C.C. invites all other members of the Zoo to write him in care of General Delivery in his town. Ed is an F.A.C. Ace, but since his five members have all moved away he's somewhat of a lone eagle as well as a red cockerel.

Kentucky lads are invited to contact F.A.C. Cadet J. C. Holdridge, of Box 431, R. R. 5, Louisville, if they're interested in forming a model builders' club. Young Holdridge has done quite a bit of modeling, so this appears to be a good chance for F.A. fans in the Louisville section to get together and make things hum.

(Continued on page 73)



Meet one of our top-flight modelers! Henry Struck in his name, and he's the author-designer—as most of you know—of the popular "Trail Blazers of the Air" series in our model department. Hank was snapped at work in the well-equipped shop that he shares with Louis Garami, another author of great repute in the model airplane game.

All Questions Answered

Reedy Borchert, Cleveland, Ohio:— Baron von Richthofen was credited with 80 victories. The Curtiss Hawk P 36 is said to have a top speed of 235 m.p.h. The D-7 Fokker did 120, the D-8 (Flying Razor) about 128, and the Fokker triplane 123.

Al Lockhart, Winterport, Me.:— What's the plane in the picture you sent in? Well, I am not quite certain, since it's rather hazy. But it looks much like a Brewster Navy ship-board fighter, whose performance figures have not been given out yet by the Navy Department. We do not know where you can obtain photographs of noted aviators. As to that "Death Ray" question of yours, we can only presume that once they're out of the range of the ray, the affected planes would be able to start their motors again. But meanwhile the enemy "ray" planes would finish off

their bombing unmolested, and if the defenders flew back at them the ray could again be brought into use.

Tex Royal, Marlborough, New Zealand:— Thanks for the nice letter on the clipping from that old *Sky Birds* magazine. You might be interested to know that the same story in full length will soon be on sale throughout the British Colonies under the title *Hell in the Heavens*. I hope you like it.

M. A. Pickering, Stockton-on-Tees, England:— You can write us direct for a subscription (10 shillings is the price). Sorry, but we cannot sell the photographs we use in our magazine.

Bobbie Mathews, Lee-on-Solent, England:— We have searched all through the March issue of our magazine without finding the mistake you bring up

And Now~ We'll Ask You a Few

- 1 Who was the pilot of the trans-Atlantic Fokker airplane known as the *Friendship*?
 - 2—On what noted trans-Atlantic flight did a youngster stow away in the "19"?
 - 3 Who was the passenger aboard the Belgian *American Girl* flown by George Haddenan?
 - 4—What trans-Atlantic flying boat came down in flames and was still saved?
 - 5—What was the first actual attempt to cross the Atlantic by air?
 - 6—How many members of the Junkers *Bremen*, first across the Atlantic from east to west, are still alive?
 - 7—What was the name of Capt. Charles Nungesser's plane which attempted a trans-Atlantic crossing in 1927?
 - 8—Name the plane which made the first non-stop flight from New York to Germany.
 - 9—Who flew the *Miss Veedol* from Floyd Bennett Field to Wales in July, 1931?
 - 10—What was the 'Untin' Bowler?
- (Answers on page 80)

regarding the Blackburn Shark. Are you sure you have the right issue?

Reg. S. Denny, New Zealand:— The chief difference between the rotary and
(Continued on page 89)

The Airmail Pals

ONE OF THE BEST pal letters of this month's batch came from 15-year-old Bob Penprase. And maybe his "scribblin'" ability is natural, since his Dad is a school principal down there in North Queensland, Australia, where he lives. Anyway, here's what Bob says:

"I would willingly correspond with fifty Americans interested in aviation. So if you could introduce me to anyone who would write, I would be ever grateful."

Fifty of 'em! Well, Bob, you're tackling a big job if all your letters are going to be as good as this one. But

you can now consider yourself introduced to our Airmail Pals. And to help the acquaintance along, we'll mention that Bob is taking aero engineering through an International Correspondence School course. His actual flying experience includes passenger hops in many ships. Among them are the Gypsy Moth, Puss Moth, Dragon Rapide, Monospar, and various types of Stinsons.

His mail address, by the way, is Victoria Estate, via Ingham, North Queensland, Australia.

Charles McLean, of Lumberton, N. C., is the lad to whom we forwarded Bob's original letter. Charlie composes a choice epistle, too. And besides being interested in aviation, his tastes include many other things that jibe just right with Bob's hobbies. Some of these are photography, music, radio, contests, and the collecting of Indian and war relics, matchbox covers, stamps, coins and bills.

Many other missive mailers this month are definitely heading toward aeronautical careers, it would seem. Here's Harold Sweet, of Stratford, N. Y., for instance, who's entering Rensselaer Polytechnic Institute this fall. While aero engineering ranks first among Hal's interests, of course, he's a great outdoorsman, too. And he has a fine flair for fishing, football, skiing, hunting, basketball, and baseball.

It wasn't very hard to find a good pal for Hal, since the lad who wrote the very next letter in the stack seemed to be a made-to-order buddy for him. This Airmail Pal was George Hering, of Hales Corners, Wis. George, too, is working toward an engineering future, and in the line-up of general hobbies, he matches exactly with young Sweet. In addition, he enjoys golf, roller-skating and swimming. George also has a nice gun collection. At the present time it comprises 17 different weapons—rifles, pistols, and shotguns.

And now—S'long, pals!

—THE RIGHT HONORABLE PAL DISTRIBUTOR

HOW TO GET AN AIRMAIL PAL

FIRST, write the best possible letter you know how. Use your best pen-and-ink handwriting or a typewriter. In your letter, introduce yourself fully—for this is the letter we'll forward to the pal we'll pick out for you. Tell your age, your interests in aviation, your other hobbies, and any additional items that might interest a new friend.

Then on a separate sheet tell the R.H.P.D. what kind of an Airmail Pal you want. Send your letters to Airmail Pals, Flying Aces, 67 West 44th St., New York, N. Y. Be sure to enclose a stamped, self-addressed return envelope, plus five cents in stamps or coin for each pal requested (our fee for the R.H.P.D.'s "Kitty"). We'll try to supply you with a pal in line with your specifications, although we cannot guarantee to fill the bill exactly every time.

Your new pal's letter will be sent to you, and yours to him—after which you will correspond direct.

Do not ask for "lists" of pals. We cannot supply them.

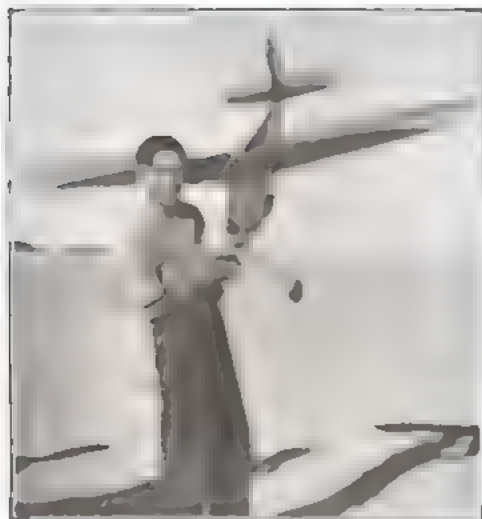
REGARDING FOREIGN PEN PALS

PLEASE NOTE that FLYING ACES' foreign circulation is only in English-speaking countries (specifically, Great Britain, Australia, New Zealand, and Canada). Therefore we cannot undertake to supply you with pen pals in Germany, France, China, etc.

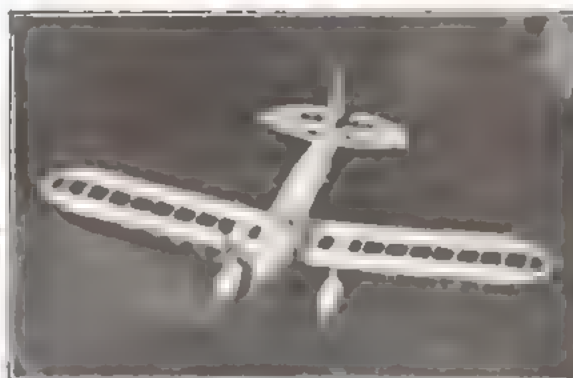
If you are an American resident and want an overseas pen pal do not write a pen pal letter. Instead, send us a short note telling in a general way what kind of a chap you are and what kind of a pal you seek. Enclose a stamped, self-addressed return envelope and five cents for each pal called for. A foreign writer's letter will be sent to you, then you may correspond with him direct.

If you live outside of the United States and want an American pen pal write a complete letter as described in the first paragraph of this box, and send it without the return envelope but with an International Reply Coupon worth five cents. Get the coupon from your local postoffice. Your letter will be forwarded to an American correspondent, after which you need only wait for his reply.

With the Model Builders



Left: Displayed by Ed Power, of Yuma, Ariz., this Quaker Flash gas craft recently turned in a time of 30 mi. to sec. and reached an altitude of 5400 feet! The flight was checked by a pilot in a full-sized plane. Ed built the model from a Megow kit.



Right: Equipped with movable controls, this 3/4" scale Ryan ST is being built by Norm Floering, of Melrose Park, Ill. Norm plans to have his sheet balsa covering exactly like the smooth metal skin of the real Ryan.



Arizona seems well represented on our page this month, for here's a second offering from that state—a Bristol "Bulldog" modeled by Dave Campbell, of Prescott. Dave says there's a stack of careful detail built into his ship, including radio and earphones, instrument panel, throttle, safety belt, and bomb release.



Stable and easy-flying, this "Eaglet" is the third gas model that Herman Zwinger, of Oradell, N. J., has built. It's powered with a Madewell Mite motor, and Herb says he's mighty proud of his job. Can't blame him, can you?



Left: From Elgin, Ill., comes this unique RCD-1, a twin fuselaged transport designed and built by Robert C. Dierker. "And if this kind of ship doesn't suit you, challenges Bob, 'wait until you see my

of REALLY revolutionary design!"



audience is the "United States" since he's traveling all the time with his snappy dance band—exhibits a Brown-powered Stinson model that he's built. Skveter constructs many models, but he has to sell them after only a few flights because of space limitations "on the road."



Right: And here, fellows, is one of F.A.'s most loyal feminine readers—Kay Juranic, of Red Hook, who with the rubber job helped her brother, Walt, build. Still another helper on this model was August Mulus, who wound the paint brush after Walt and Kay had completed construction. Nice co-operation, huh?

reports Tad Dietrich, of Charlotta, Vt., "I designed her myself," Tad continues. "and even on her first flight she took off, climbed, then glided in to a perfect landing without so much as a bounce."



Construct the Navy

Brewster XSBA-1

By Nick Limber

(With Photographs by Julius Sorkowski)

DUE to the present unsettled international situation, we Americans have been paying much closer attention to military developments among the major powers than we used to, and discussions of army and navy strengths and comparative air force efficiency have become everyday matters.

Experts professional and otherwise — have made profound declarations on the various phases of world armament, but the thing that has hit us the hardest has been the accusation that our own American air arms are sadly lacking in modern equipment and trained personnel. To some extent, perhaps, the facts presented in support of this claim have been accurate. However, there has been little or no mention of one of the chief reasons for the shortage.

And that reason is the American policy of constantly developing single ships of new type instead of manufacturing hundreds of planes from existing plans—a policy which keeps us one hundred per cent up-to-date on the *quality* of our ships and prevents us from tying up billions of dollars in huge fleets of planes which may become obsolete long before the ships themselves have become unserviceable. In other words, our *new* ships are *really* new.

A good example of this development policy is the Brewster XSBA-1.* Delivered to the Navy about a year ago, the original craft has been undergoing constant and severe service tests ever since. And now 30 more of these ships are to be built. These of course will incorporate changes suggested by the tests and will fill the Navy's present needs for ships of such a type, but when "still more perfect" planes come along, our fleet force won't be kept from adopting them by having too many of the present type in its hangars.

* Broken down, XSBA-1 literally means *Experimental Scout-Bomber* manufactured by *Brewster* and the first of its type. The X means *Experimental*, the SB refers to *Scout-Bomber*, the A is the official Navy designation for the Brewster Aeronautical Corporation and of course the 1 means No. 1.

Latest in the lineup of Navy scout-bombers is this experimental job from the Brewster shops in Long Island City, N. Y. A speedy midwing adaptable for use as a fighter, the ship is said to have "what it takes." Anyhow, Uncle Sam has ordered thirty—and that means the ship must be good! And good, too, is this nifty flying scale model prepared for you by Nick Limber.

The XSBA-1 is designed for scouting and bombing but is adaptable as a fighter. The armament includes fixed machine guns, flexible guns in the rear cockpit, and bomb housings within the fuselage.

Constructed entirely of metal, the plane has full cantilever wing and tail surfaces and a retractable landing gear. Flush riveting of the exterior metal covering reduces skin friction to a minimum. A single split type flap extends across the wing and is manually controlled from the

front cockpit for easier landings.

The craft is equipped with a three-bladed constant speed Hamilton-Standard propeller and a Wright G series Cyclone engine rated 950 h.p. at 2200 r.p.m. Actual performance figures are carefully guarded by the Navy department.

Specifications of the craft are as follows: Wing span 39', overall length 27' 10", overall height 7' 7", and wing area 259 square feet.

Brewster engineers have developed an export version of the XSBA-1. It is designated as the Model 138 Military Two-Seater.

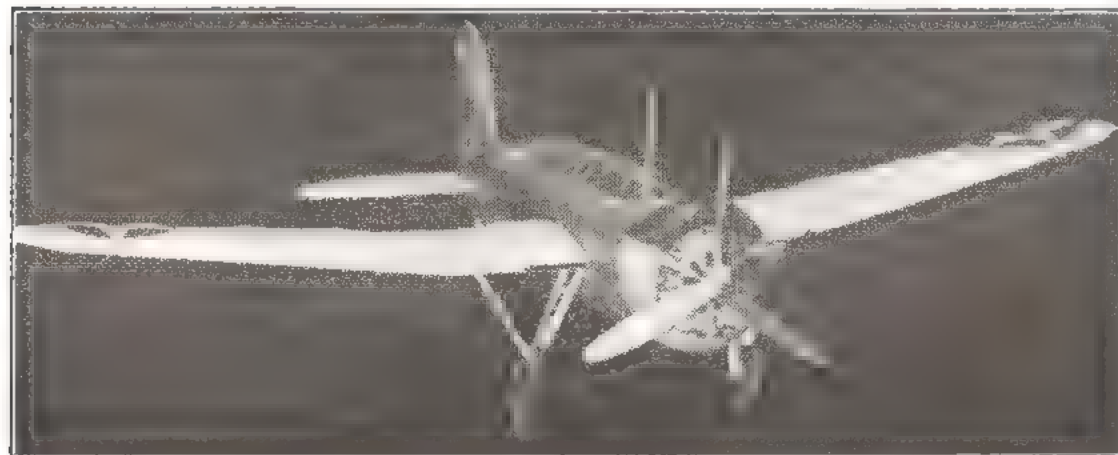
CONSTRUCTING THE FUSELAGE

AND NOW we have the facts and figures in mind, let's start work on a flying scale model of the XSBA-1. The fuselage is made of two pieces of soft balsa, 11" by 2 1/4" by 1 1/8".

From Plates 1 and 3, trace the side and top views on each of the blocks. After shaving away the excess balsa, shape them as indicated by the templates given for the various stations. A sharp knife and sandpaper are the only tools required.

A curved chisel is used to scoop out the "innards" of the blocks, and then the walls are sanded down to a thickness of about 1/16". The two shells are then cemented together to form the body.

A sheet of 1/64" balsa or cardboard is used to form the turtleback portion of the cockpit enclosure. Refer to the front view drawings of the ship for the correct curve. Celluloid windshields are cemented to this section,



Left. Right smartly done, say we, is this scale model of the Scout Bomber Nick Limber, who worked direct from the original Brewster plans in developing the replica, didn't pass up a thing. So here, in the completed job, you can see the dummy motor—the big ship uses a 950 h.p. Wright Cyclone—landing gear details, and the like, plus the official markings that the Navy has applied to our model's "big brother."

and then with India ink the metal frame is outlined.

A metal tube cemented to the fuselage directly in front of the windshield simulates a machine gun sight.

To form the cowl, make five sections from a sheet of balsa $2\frac{1}{2}$ " wide, as indicated on Plate 3. Note that four of these sections are to be $\frac{1}{4}$ " in thickness while the fifth is only $\frac{1}{8}$ ". The center of each is bored and notched. Cement the sections together, and after the cement has hardened, finish off as shown in the side and top view drawings.

The front section is cut out to take a dummy engine, which is made of nine balsa cylinders cemented into the cowl and painted black. The cowl is cemented to the fuselage and allowed to dry.

TAIL AND WING CONSTRUCTION

THE tail surfaces are made of $1/16$ " sheet and $1/16$ " square balsa formed as shown on Plate 3. Trace the outline of the surfaces onto the sheet balsa and cut them out. Then cement the strips in place and allow the cement to harden. It is advisable to place a flat heavy object over the assembly to prevent it from warping while drying.

Cover the units with tissue. Use thick banana oil to attach the paper.

Construction of the wing (See Plate 2) begins with the ribs. Trace each rib onto a sheet of $1/16$ " balsa and after cutting it out, shape outline with fine sandpaper. Note that four No. 3 ribs and two each of the others are required.

Each wing half is made in two sections—the wing root and the outer panel. Measure off the required short pieces of spar for the wing root section. Cement Ribs 1, 2, and 3 in place, and allow to harden. Sandpaper the leading and trailing edges of this section and cement to the ribs. Cover the portion of the panel between Ribs 1 and 2 with $1/64$ " sheet balsa.

The same procedure is followed in constructing the outer wing panels. The tips are made of $\frac{1}{8}$ " sheet balsa and sandpapered to shape after all the cement has dried. Use smooth sandpaper and don't rub too hard.

Cement the outer panels to the root section then, and be very sure that a dihedral of $11/16$ " is maintained at each tip. Cover the wing with tissue.

The nose plug is cut from $\frac{5}{8}$ " square hard balsa. Four pieces of $1/16$ " hard balsa strip are cemented to it to "lock" it within the cowl.

Carve the tail plug from a piece $1"$ by $\frac{1}{2}"$ by $1\frac{1}{4}"$. Follow the details given on Plate 3, and cement the "wings" (actually a section of the elevator) to the plug. Use $1/16$ " sheet stock for these wings.

LANDING GEAR AND PROP

REFER to the front view of the craft on Plate 2 for details of the landing gear. The plan shows the true length of the struts.

The outer strut is made of hard balsa as indicated in the plans. It is cemented to the wing and also to the balsa piece to which the wheel is fastened. The lower end of the bamboo strut is inserted into the balsa part and the upper end into the side of the fuselage (See Plate 1 for side view).

The tail wheel strut is built as shown, and may be shaped from celluloid or three pieces of balsa. It is cemented directly to the fuselage.

BILL OF MATERIALS

All Wood Used Is Balsa

(Complete plans will be found on the following pages)

Two pieces of $11"$ by $1\frac{1}{8}"$ by $2\frac{1}{4}"$ for fuselage;
One sheet of $1/64"$ for turtleback and wing root covering;
One sheet $\frac{1}{4}"$ by $2\frac{1}{2}"$ for cowl;
One sheet $\frac{1}{8}"$ by $2\frac{1}{2}"$ for cowl and wing tips;
Two sheets $1/16"$ for ribs and tail surfaces;
Two strips $1/16"$ square for tail;
Two strips $1/16"$ by $\frac{1}{8}"$ for wing spars;
One strip $\frac{1}{4}"$ by $\frac{1}{8}"$ for leading edge;
One strip $1/16"$ by $\frac{1}{8}"$ for trailing edge;
Three pieces $2\frac{1}{4}"$ by $\frac{3}{8}"$ by $\frac{1}{8}"$ for prop;
One piece hard balsa $\frac{5}{8}"$ square by $1\frac{1}{4}"$ for nose plug;
One piece hard balsa $1"$ by $\frac{1}{2}"$ by $1\frac{1}{4}"$ for tail plug;
Two strips bamboo for landing gear;
Celluloid for cockpit enclosures;
Number .028 wire;
Cement, paints, tissue, sandpaper;
Brown rubber, celluloid wheels;
Metal tubing for machine gun sight.

The propeller is made from three blocks of balsa, each measuring $2\frac{1}{4}"$ by $\frac{3}{4}"$ by $\frac{1}{2}"$. Cement them together as indicated on Plate 2. Carve the prop only when you know that the cemented joints cannot come apart. A thin layer of cement must always cover the joint.

All wire parts of the model are made of .028 wire. Long nose pliers are of value in bending the wire.

ASSEMBLING THE MODEL

BEFORE assembling the model it will be convenient to cut away the portion of the fuselage which is to represent the housing for the landing gear when retracted. The sections cut out should be of the same diameter as the wheels and should also allow for wing channels into which the landing struts would fit.

A section to match the wing root chord is cut away in order that the wing may be inserted enough to allow cementing. The sheet balsa covering between Ribs 1 and 2 makes an excellent base for the cement and insures a sturdy joint.

Next, the landing gear may be assembled and installed as described, and celluloid wheels attached. When fitting the tail unit in place, be sure that the rudder is exactly vertical and the elevators exactly horizontal. This is most important.

A miniature landing light is fashioned from balsa and cemented to the left wing.

PAINTING AND FLYING

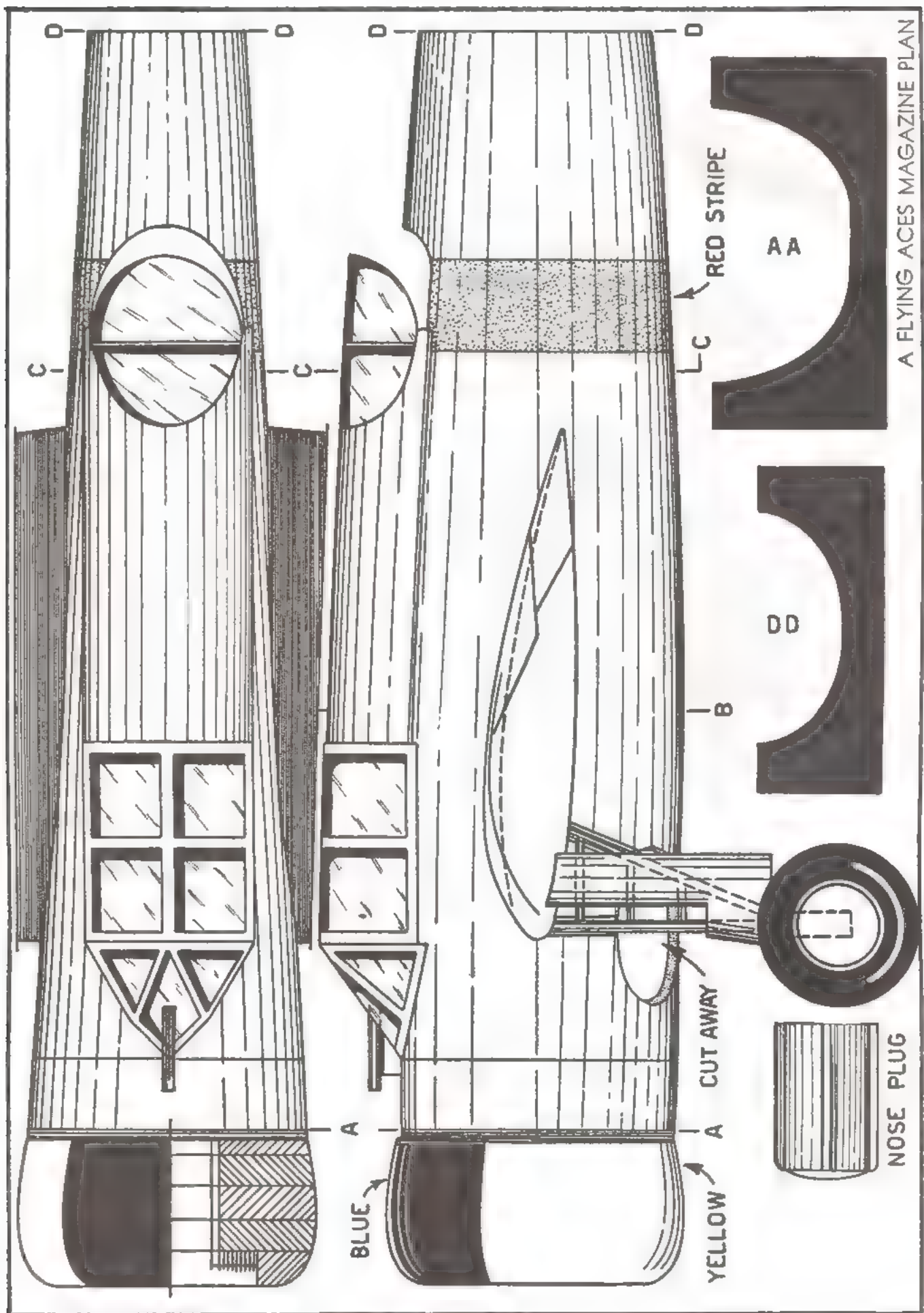
COLORS for the model can be the result of colored dopes or colored tissue. The cowl of the craft is yellow with a blue top as shown in the plans and photographs. The fuselage is silver and should bear the lettering U.S. NAVY in black, below the elevators. A red stripe is painted around the fuselage at the rear cockpit.

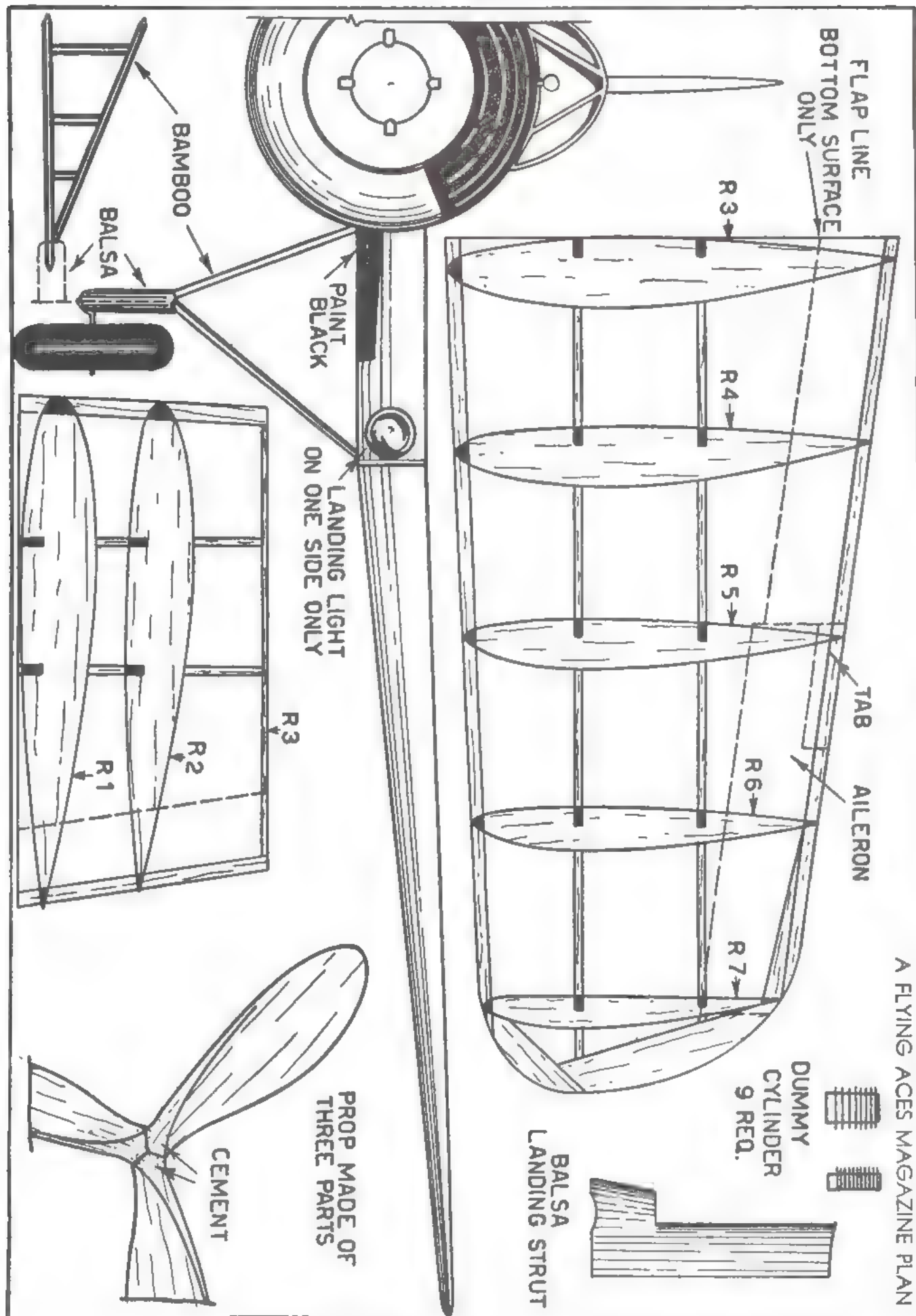
The wings and tail unit should be finished in yellow, and the official Navy insignia should be applied on the rudder and wings.

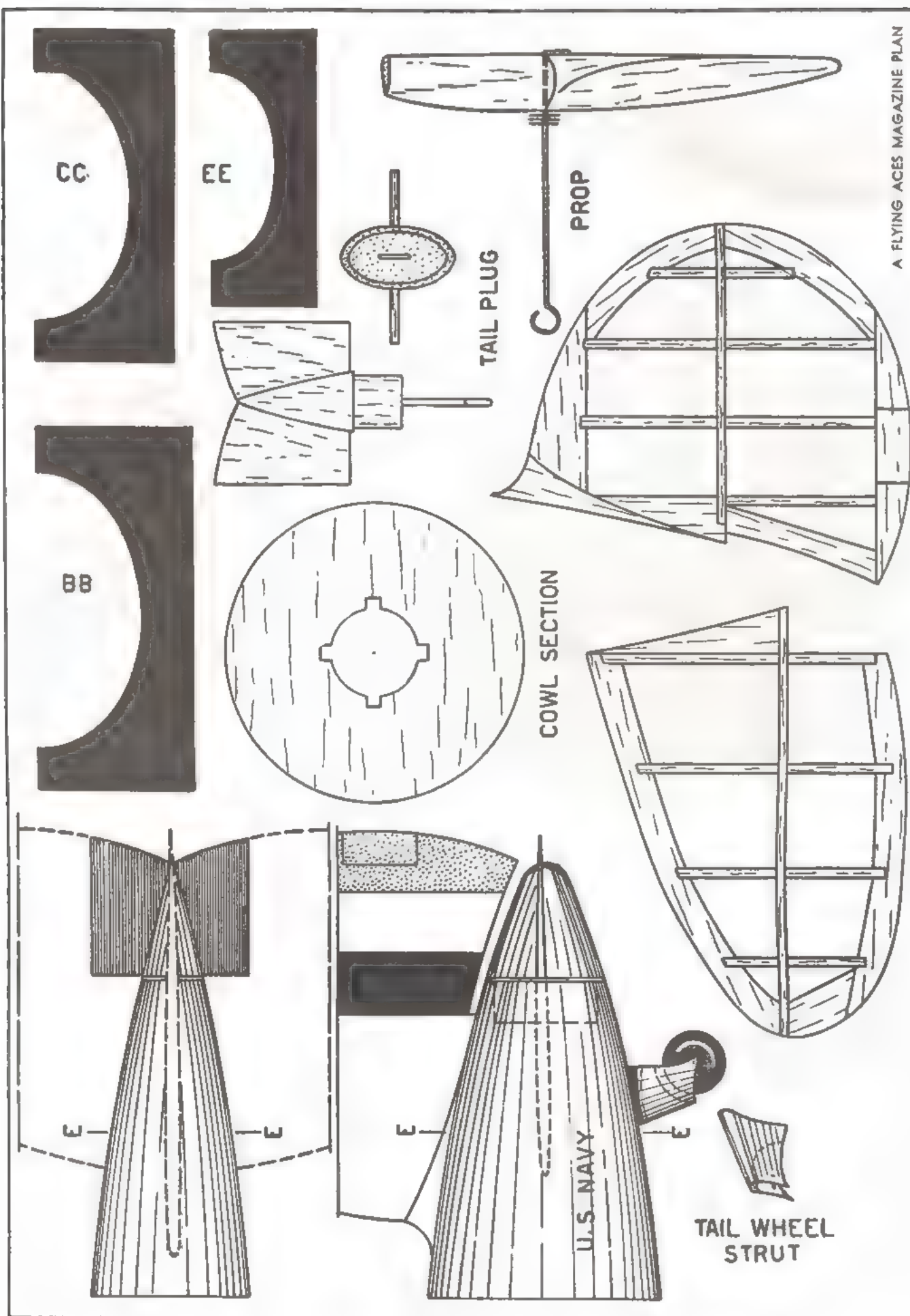
(Continued on page 74)



Rather than trying your hand at duplicating the star-in-circle insignia shown here so plainly why not drop into your dealer's shop and pick up decalcomania transfers? They're easily applied, and they give a really workmanlike finish. The official Navy colors on the tail, of course, are red, white, and blue, with the red as the rearmost color.







News of the Modelers

"QUEEN CITY" WINNERS NAMED

UNDER the direction of club president and N.A.A. Contest Director Walt Marienschek, the Queen City Gas Model Club of New Jersey, Plainfield, recently held its first annual open meet. Although the weather was somewhat unfavorable 95 contestants gathered and the affair was highly successful. The winners in the various events were:

Thirty-second engine run—Roger Des Broses, of New York City; Herbert Grimes, of Iselin, N. J.; Don McFarland, of Tenafly, N. J.; Larry Low, of New York City. *Workmanship*—Harold Hjelmlo, of Staten Island, N. Y.; Don McFarland; Hague Donsbach, of Madison, N. J. *Highest man in three official flights*—Roger Hammer.

The officials in the tourney were: Walt Marienschek, director; Joe Mastrovitch, registration; John Findra, Sr., field manager; Arthur Gray, chief timer; Henry Marion, advisor, and Frank Boyd, meet secretary. Mr. Boyd also served as F.A. reporter.

CORNING (N. Y.) HOLDS FIRST MEET

THREE WEEKS after it was organized, the Corning Aero Club, of Corning, N. Y., held its first meet. The affair was sponsored by the Corning Cut Rate Sporting Goods Store with the assistance of American Airlines, which gave permission to the group to use the Corning-Elmira Airport.

In the Gas Model Endurance Event, the following were the winners: Joseph Friebis, of Corning; James Cashdollar, of Elkland, Pa.; Vincent Woepfel, of Corning. Abbott Putnam and Tony Luffrel won the Gas Model Appearance Display, and Putnam and Richard Roberts came out Numbers 1 and 2 respectively in the Rubber Model Endurance tourney.

Ted Cramer won a *Super Buccaneer* kit for the longest flight of the day; his time was 10 min. out of sight (unofficial).

The unfortunate part of the meet was that only one plane of all that flew escaped damage, for high and gusty winds were the "order of the day."

MILWAUKEE N.A.A. UNIT GROWS

ORGANIZED in the early part of 1938, the Milwaukee Gas Model Chapter of the N.A.A. has already increased its membership from 75 to more than 200. The chapter is headed by Karl Girtan, a Milwaukee business man who's long been famous for his gas model activities. The directors are Harold Sinskey, Elmer Riemer, and Harold Auler.

During the summer, the organization held two very successful meets, the second one drawing 97 contestants from Wisconsin, Michigan, Illinois, and Iowa. At this meet, which was held in September, William Bates, Jr., of Madison,

established a new national gas record, his time being 11 min. 24 sec.

Regulated according to official N.A.A. rules, the tourney drew more than 10,000 spectators. Local "gasoleers" interested in lining up with this live outfit are requested to write President Girtan at 231 W. Wisconsin Ave., Milwaukee.

OBARSKI WINS CHICAGO TOURNEY

RICHARD OBARSKI, of Chicago, came out "tops" in the recent Mid-western States Gas Model Contest sponsored and conducted at Harlem Airport, Chicago, by the Gas Model Aeronauts. Besides making the best flight of any Chicago contestant, Obariski also turned in the best flight for ships under 4½' span and the best total (8 min. 43.7 sec.) of three official flights.

Following Obariski in the three-flight event were Walter Good, of Kalamazoo, with 8 min. 26.5 sec.; Ed Manthey, of Maywood, Ill., with 8 min. 05.8 sec., and Joe Konefes, of Chicago, with 7 min. 33.3 sec.

The prize for the worst crackup of the day went to G. E. Shearhod, of Chicago, whose ship was destroyed by fire after it landed. In the "over 4½' class," Bob Mazel, of Chicago, led with a time of 5 min. 14.6 sec. Francis Munson, of Chicago, turned in the best

Quaker model flight, and Ken Willard, another Chicago lad, flew the "lightest model that had a time of over one minute." Willard's time was 2 min. 6.8 sec.

Harold Jepperson, of Minneapolis, won the prize for the contestant traveling the longest distance to attend the meet. Besides Jepperson's state, Minnesota, and the "home" state, Illinois, seven other states were represented.

While only \$193 was realized by the Aeronauts in entrance fees at \$1.00 apiece, a total value of \$652 in prizes of various kinds was distributed between the 52 prize winners. The times of these winners ranged from 8 min. 43 sec. down to 3 min. 31 sec. for a total of three flights.

TRENTON RESULTS

WINNERS in the Second Annual

Eastern States Gas Model Meet held recently at Trenton, N. J., were announced as follows: *Thirty-second gas event*—Magnus Anderson, John Findra, Jr., William Deans, and Joseph Mastrovitch; *Design and Workmanship*—Larry Low, Walt Marienschek, Henry Struck; *Flight Consistency*—Magnus Anderson, John Findra, Jr.; *Lucky Winner*—Ed Seegmuller.

The meet was under the direction of Lieut. Edward C. Plummer and sponsored by the New Jersey State Police.

What Do You Say?

Here's your corner, buzzards, and it's open to all readers who have a model argument they want to get off their respective chests. Make your comments short and snappy, and we'll try to squeeze 'em in.

SUGGESTS CREDIT PLAN

Editor, FLYING ACES:

Just a line to ask why model airplane manufacturers don't sell kits and engines on the installment plan. I—and a host of other fellows in the game—can horde up fifty cents and sometimes a dollar per week. But it's tough accumulating enough to buy a big model kit or engine at one smack.

Why couldn't we get our supplies and pay for them while building the craft?

DON ZIMMERMAN,
Alton, Ill.

SATISFIED

Editor, FLYING ACES:

In one issue of F.A., some crack-brained modeler approves or disapproves of one or several types of models. In the next issue, some other glue-and-balsa cobbler approves of the disapproved type of the aforementioned crackbrain and disapproves of the approved one!

So what? The result is that we get no changes in our swell F.A. mag—

which is simply great, because I, the "satisfied reader" (maybe I should say we, because there are many of us) am happy about the whole thing!

Personally, I prefer the more simple models and the Griffon and Phineas stories. But do I crab about the others and ask you to make changes? No! Because I have some consideration for the guy that likes the opposite things and I'm willing to give him a break.

And besides, who doesn't like variety? It's my opinion that the F.A. stories are too good to miss. So I say: Keep F.A. just like it is—and print all the simple jobs, the goofy jobs, the complicated jobs, the super-saturated jobs, and all the plain and fancy varieties of fact and fiction that you can squeeze into its pages.

A SATISFIED READER,
Brewster, N. Y.

LIKES "TRAIL BLAZERS"

Editor, FLYING ACES:

You'll probably be glad to know that I have built all the "Trail Blazers of the Air" except the last two. And I'll be building those as soon as I have time. I'm plenty proud of this line-up of models portraying the history of aviation.

I am finishing a course at the Spartan School of Aviation, at Tulsa, Okla. And I'd like to say if there's anybody who thinks that model building is child-

(Continued on page 70)

Fly the

F.A. "Xmastick"

Al Orthof is the kind of modeling genius who can make anything fly! Maroon him on a rocky isle with nothing but a nice sharp razor blade, and we'll wager that he'd graft wings onto a mountain and dispatch it to the nearest mainland for help. And now, he's grafted wings onto Santa Claus's reindeer, producing this F.A. "Xmastick." The X, by the way, stands for Xperimental—and we'll guarantee that when you experiment with this novel job, its performance will sleigh you.

• • •

By Alan Orthof

GREETINGS, fellows! With Christmas just ahead of us and the whole world full of good cheer (we hope), we're pleased to present this special *Flying Aces Xmastick*—the niftiest and perhaps the only skyster ever designed expressly to carry our genial pal, Santa Claus. And just like Santa himself when on Christmas Eve he dashes hurriedly about the world, the *Xmastick*, too, has plenty of speed and pep.

You'll remember, of course, that back in the horse-and-buggy days a few years ago, Mr. Claus was equipped with fast reindeer and a sleigh. Well, in the *Xmastick*, he's still got 'em—except that we've grafted wings onto the quadruped and installed a rudder and stabilizer under the sleighicle—icicle—no, *vehicle*!

Yes, we know we're crazy. But so what? Aren't we all to some extent? And anyway, the *Xmastick* does fly—and nicely, too! You'll be surprised.

In making our model—for the affair *is* a model, after all—the first job to be tackled is the reindeer. To make it, cement together two pieces of 1/16" hard sheet balsa with their respective grains running at right angles. This is called "laminating." Allow the pieces to dry for at least one hour, then trace the pattern of the deer onto the resulting laminated piece.

Cut the animal out with a razor blade or jigsaw. Work with care and follow the outline closely. Finish up by sanding smooth and rounding all edges.

Mount the reindeer on a motor stick of medium hard balsa 1/8" by 1/4" by 10" in the position shown. Use at least two coats of cement. When dry, sand the entire stick smooth and taper the tail end as illustrated in our plans on the next page.

Bend a thrust bearing from No. .020 wire. The idea behind the use of wire is that such a bearing "gives" more should the model hit an object head on, thus easing the prop damage somewhat. Make the tail hook and

cement it to the motor stick. Wrap with thread for greater strength.

TAIL AND WING

RUDDER and stabilizer are cut from soft 1/32" sheet balsa and sanded to 1/64" at the tips. Sand from the center and in one direction only.

Mount the stabilizer on top of the motor stick as shown on the drawing. The rudder is mounted beneath the stick—this lowers the center of gravity and allows a smaller rudder to be used.

The wing halves are also cut carefully from 1/32" sheet balsa and sanded to about 1/50" at the tips. Mount them on the reindeer as shown on the plan. Allow 2" dihedral under each tip. Where the wings join to the mount, apply at least two even coats of cement. When cementing, be sure that the dihedral is even on both halves.

Carefully bend the landing gear from No. .020 wire and mount it in the position shown. Each leg should be 3 1/4" long. Cut the wheels from 1/8" hard balsa sheet and round off the edges. Slide the wheels onto the axles, and bend the ends of the axles upward to prevent the wheels from falling off.

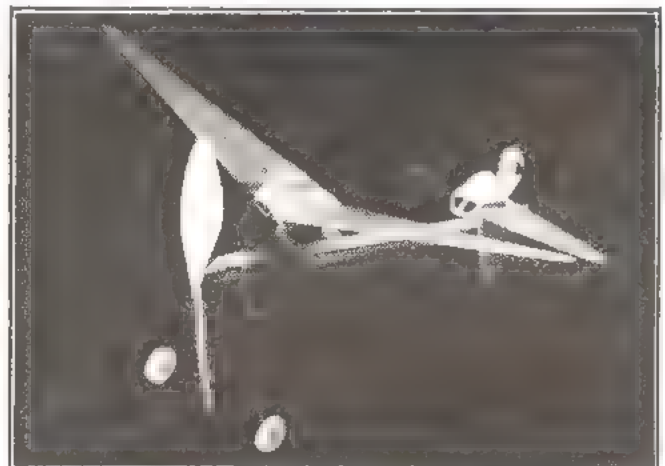
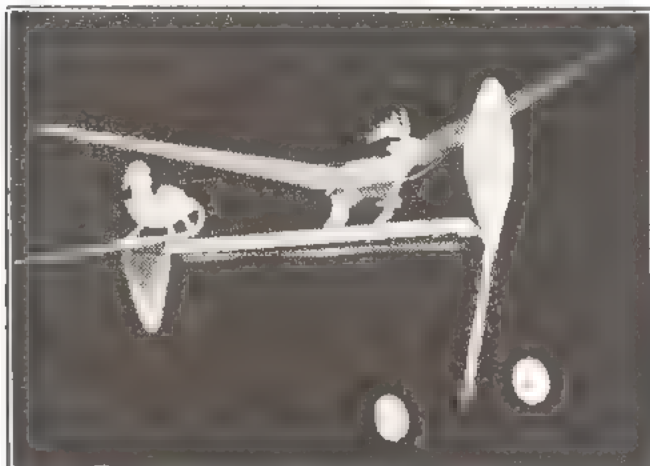
Carve the propeller from a block of medium hard balsa 1" by 5/8" by 5 1/2". Take great care in doing so, as the flying qualities of the *Xmastick* can be ruined by a poorly made prop. The prop should be about 1/16" thick at the hub, tapering to about 1/32" thick at the tip.

Bend the prop shaft from No. .020 wire and push it through the center of the airscrew. Slide two washers onto the shaft, then attach it to the thrust bearing.

THE "XMASTICK" SLEIGH

AND now we're ready to build Santa Claus and his sleigh. Trace these onto a piece of 1/32" sheet balsa and cut them out carefully so as not to split the

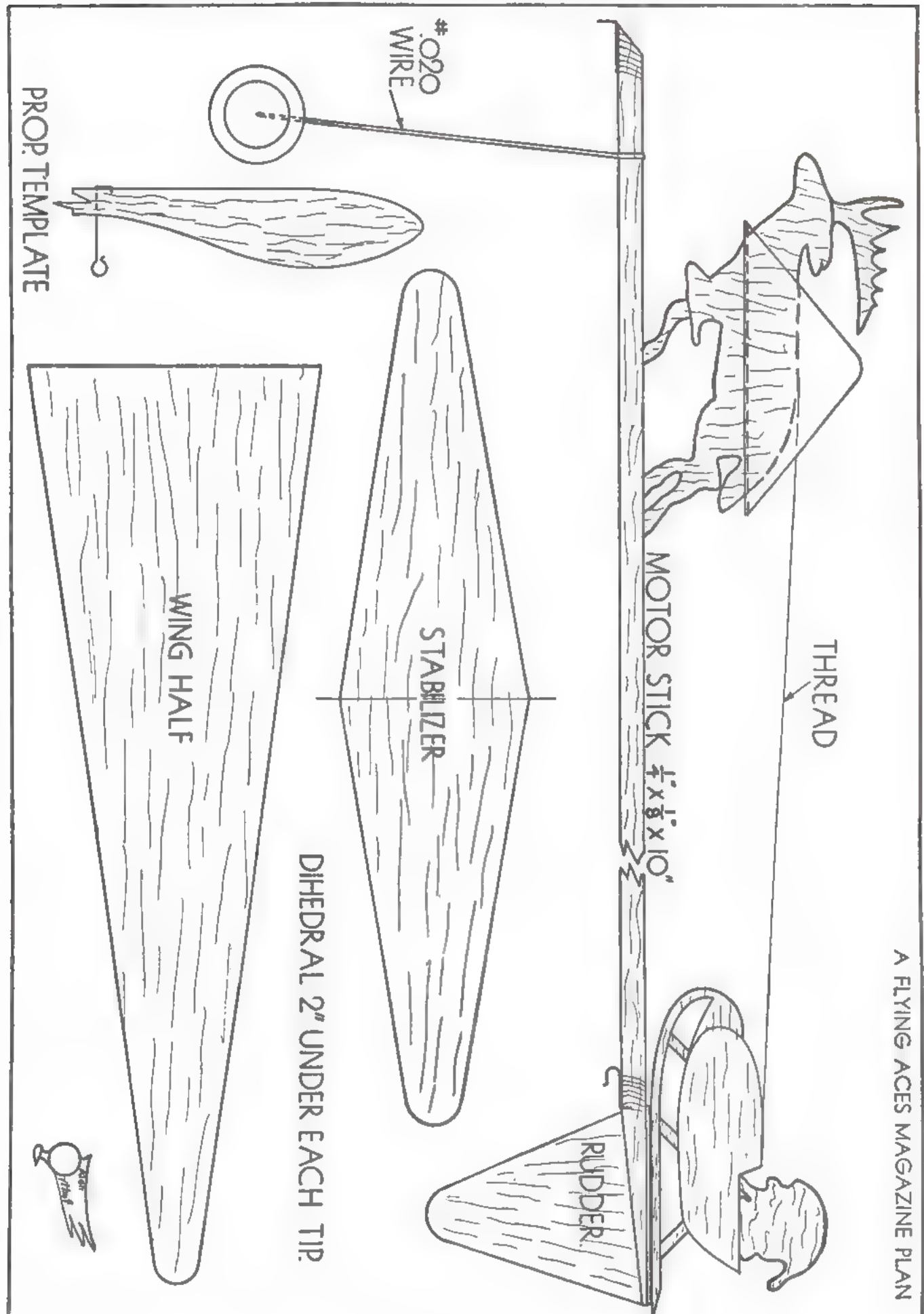
(Continued on page 79)



"Jingle bells, jingle bells, jingle ta-ra-ra—" Yesser, fellows, this pair o' pictures introduces none other than that gay old gink Kris Kringle, a.k.a. ridin' high, wide, an' handsome behind his sky-scootin', cloud-cavortin', antlered animalie. In the picture at the left, see how easy-like Al O' hof has perched the reindeer atop the motor stick. And at the right, observe that even the wings could be likened, in outline, to a tall an' taperin' Christmas tree.

AND HERE ARE THE PLANS FOR THE F.A. "XMASTICK"

A FLYING ACES MAGAZINE PLAN



Build this Beginner's "Kayo" Gas Model

Yes, it happens at every gas meet! Some rubber model builder, anxious to try his hand at building a gas job, enviously eyes the slick super-ship of an ace petroleer and turns away with a sigh. And he says sadly to himself, "Boy, she's a beaut! But she's too tough a task for me to tackle!" There's no need for shedding real tears in such a case, however. For here's a model designed expressly for the lad who's just going into the gas game—the "Kayo," a power plane that has looks and speed, yet is ridiculously easy to build. Look 'er over—and then start to work!

* * *

OUR Kayo power job results from the combined efforts of a number of builders to produce a gas model that could easily and cheaply be built by beginners, yet which would compare favorably with the so-called "super" gas jobs. And now that it is completed, we have no hesitation in recommending Kayo as an ideal gas model both for beginners and even more experienced victims of modelers' "gasitis." That the job can inexpensively be built will be apparent after the reader has checked the "bill of materials" at the end of the article.

Streamlining is secured in the model in a manner that eliminates the need for seemingly endless hours spent on a complicated elliptical surface. And semi-planking the wing not only gives great strength, but it also provides practice that will prove of value when the modeler tries his hand at more difficult jobs.

The high lift, high thrust line, low center of gravity, well forward landing gear, and the long tail moment arm, all combine to give stability both on the ground and in the air. And there's no need for carrying extra props around when a lad is flying his Kayo, because it's almost

By Claude D. McCullough impossible for the prop on the ship to strike the ground.

Kayo's flying qualities are as nearly perfect as possible. So good are they, in fact, that the original model disappeared from sight after 7 min. 41 sec. on a 30-second engine run. And that epic flight, incidentally, was only Kayo's sixth!

FUSELAGE AND WING

BEFORE starting construction, scale up the model's plan to full size on a large sheet of paper. White wrapping paper will serve the purpose admirably. Make the drawing carefully to evade possible constructional difficulties.

The fuselage is very simple. Follow the plans closely in building it, however. Use hard gas model balsa $\frac{1}{4}$ " square. Cement all joints thoroughly, and where each cross-brace meets the longerons drive a $\frac{1}{8}$ " copper brad. The rest of the fuselage plans, including those for the landing gear, are self explanatory.

For the wing, make a template of tin or wood of the full-size rib (Plate 1) and cut 18 ribs from $\frac{3}{32}$ " medium balsa. Next, lay out the spars on a large flat surface and cement the ribs accurately in position, using pins to hold them until thoroughly dry.

The tips are cut from $\frac{1}{8}$ " flat balsa and cemented in place. Spar gussets, of $\frac{1}{8}$ " plywood, are bound securely with thread at all points around the dihedral breaks.

Planking the wing in accordance with the plan (Plate 3) should give no particular difficulty if care is used.

The balsa used should be very soft and pliable, and if it should show a tendency to crack when bent around the wing curve, steam it over a tea kettle or spray it with hot water.

TAIL AND COVERING

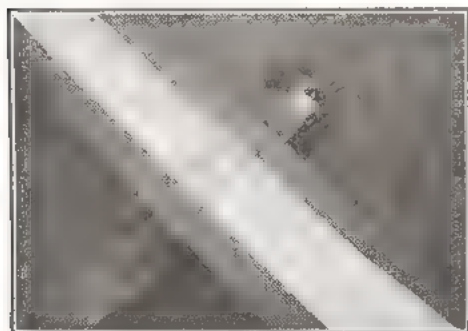
CONSTRUCTION of the tail is quite similar to that of the wing. All wood sizes are given on the drawing. Although the tail surfaces are semi-elliptical, no trouble should be found in bending the balsa to the curve of the ellipse.

The skid is of $\frac{1}{4}$ " flat balsa, streamlined slightly. Bending a piece of $\frac{1}{16}$ " wire around the outside outline will strengthen it considerably.

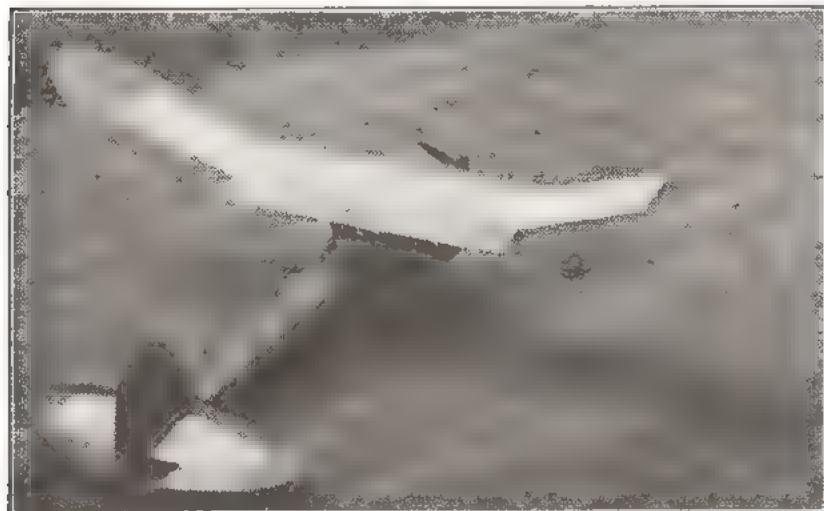
Selection of the type of covering is entirely up to the builder. Silk is more expensive than bamboo or other tissue paper, but it allows a cleaner job. However, a good medium material which is slightly heavier than silk and more durable than paper is Nainsook, which may be bought at most any dry goods store.

Dope is usually a bit too light for attaching the covering but a half and-half mixture of heavy cement and dope is easy to work with and it holds the covering ad-

(Continued on page 80)



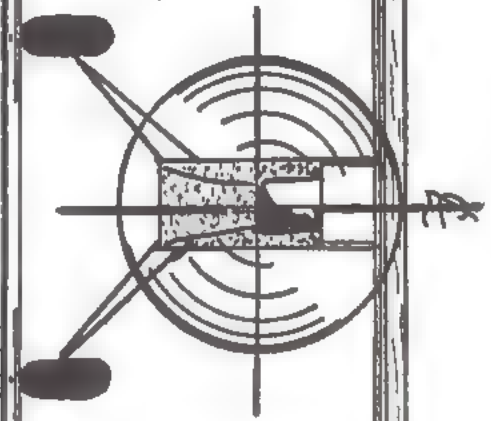
Left: Besides showing how the wing is attached to "Kayo's" fuselage, this picture gives a glimpse of the snugly-fitting motor in the nose. Below: And here's "Kayo" on the runway, ready to take off for a survey flight—or sump'n—over the McCullough farm out there near Ottumwa, Iowa. Unfortunately, the original job liked the airways so well that she failed to return!



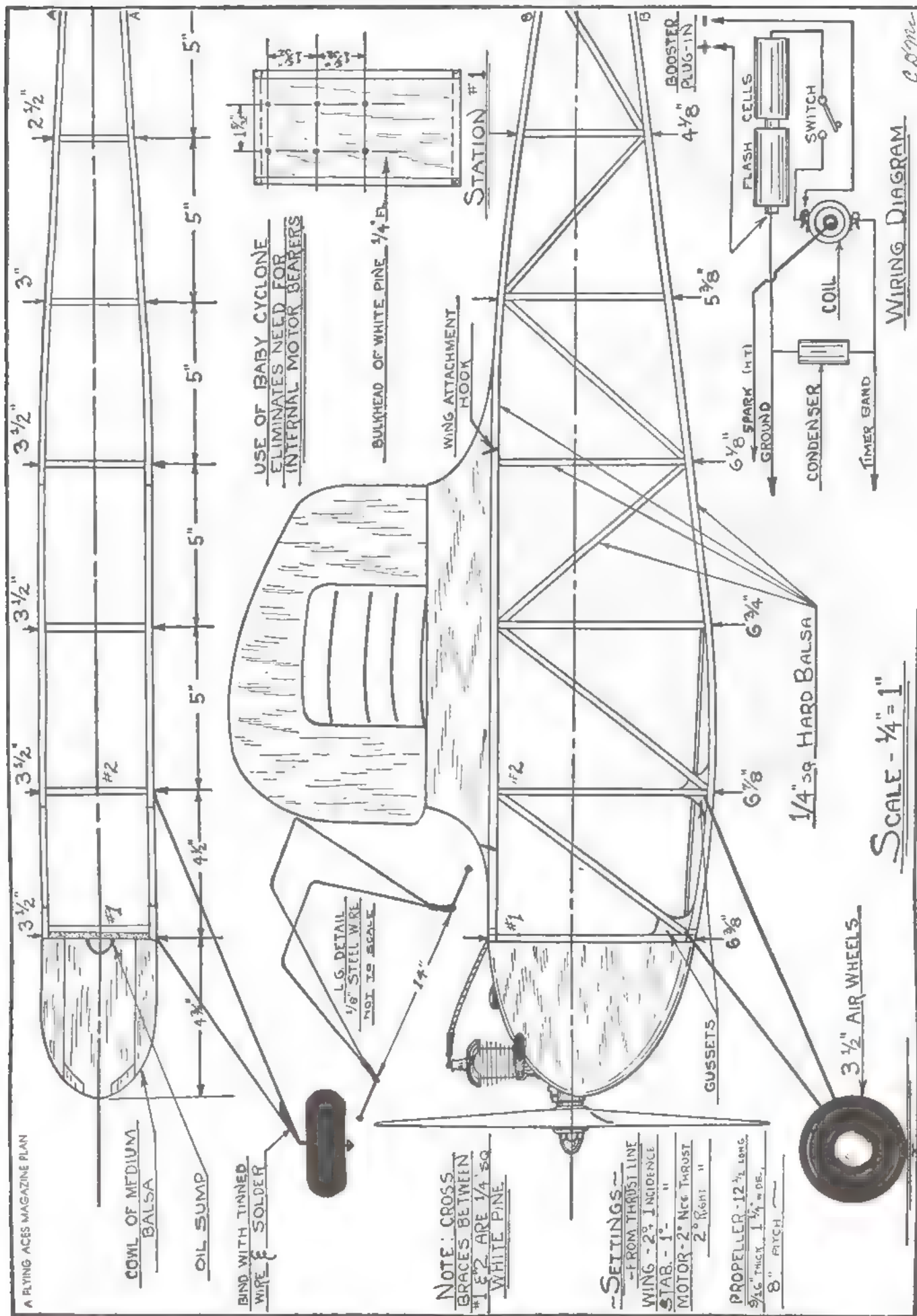
A FLYING ACES MAGAZINE PLAN

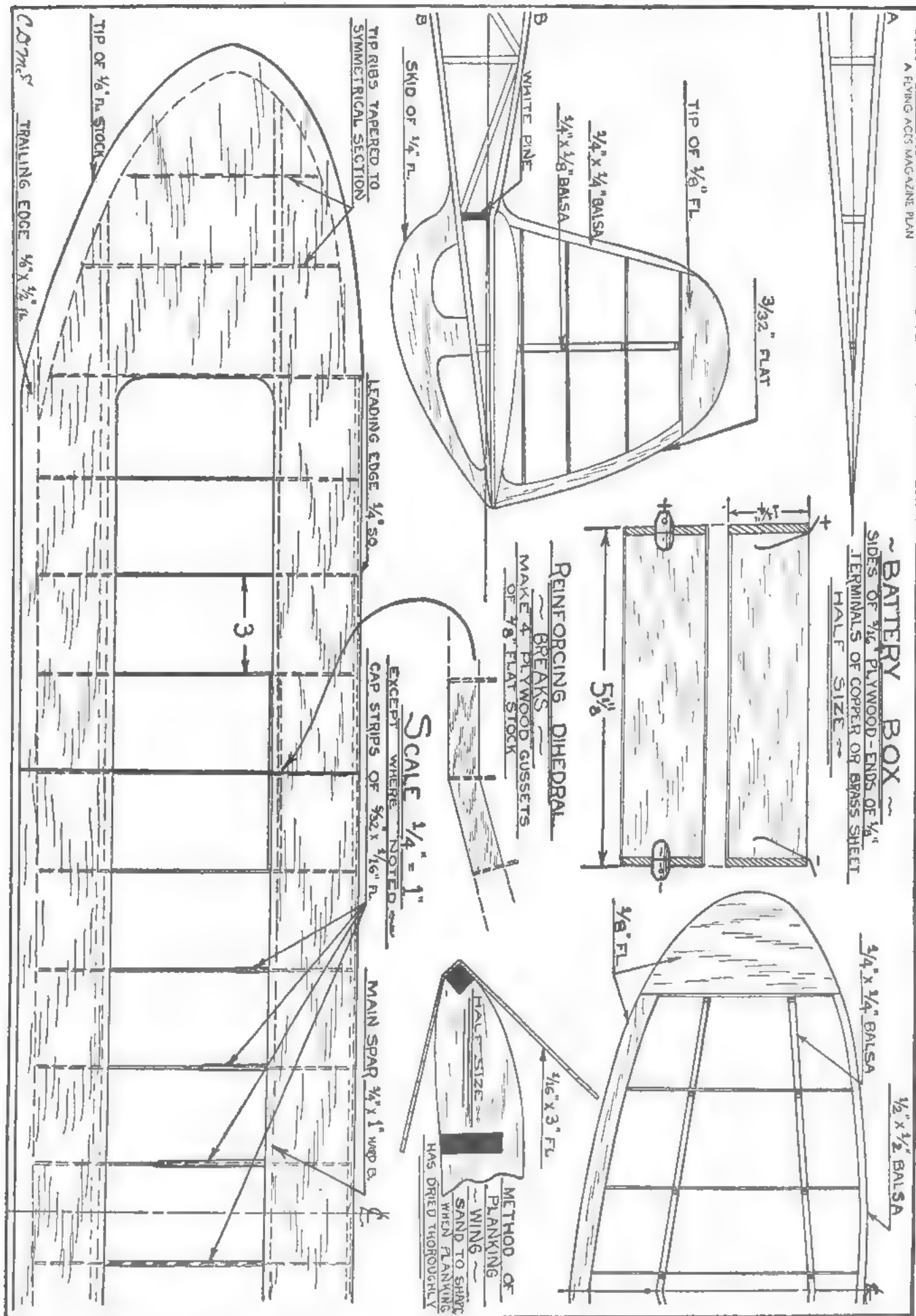


NOTE: FOR USE WITH GROWN
OR SIMILAR ENGINE INSTALL
PINE BULKHEAD TO STATION #2
ADD MOTOR BEARERS. A MET-
AL MOTOR MOUNT CAN BE MADE
OF DURAL AND BOLTED TO #1
IN SAME FASHION AS B. CYCLONE



C.B.M.





Make the

Trans-Atlantic NC-4

By Henry Struck

AERONAUTICAL advancement during the World War enabled men at last to contemplate spanning the stormy Atlantic with some reasonable assurance of success, and by May 1919 no less than five separate expeditions were preparing for the effort.

These included Harry Hawker and Lieutenant Commander Grieve with their Sopwith; Captains Frederick Raynham and C. W. F. Morgan with a Martinsyde; and Captain John Alcock and Lieutenant A. W. Brown in a Vickers Vimy. These were all making preparations up in Newfoundland. On the other side of the Atlantic, at Edinburgh, Scotland, the giant dirigible R-34 was being groomed for departure.

The fifth group, consisting of four huge U. S. Navy flying boats, was undergoing pre-Atlantic tests at Rockaway Beach, near New York City. These ships were four-engined craft, with two of the engines mounted in tandem between the wings and directly above the hull, and the other two were installed singly a few feet out on the wings. The plants were 350 h.p. Liberties.

Of these various enterprises, the Navy project was probably the best equipped and the most thoroughly prepared to face the hazards of the journey. The four Navy-Curtiss planes had been jointly designed by the Navy and Curtiss especially for the job, whereas the other ships were merely "warmed-over leftovers" from the War.

To reduce the dangers of the long over water jump to the Azores, ships were stationed at intervals along the proposed route.

After concluding extensive tests, the NC-1 (skipped by Commander Bellinger), the NC-3 (Commander Towers), and the NC-4 (Lieutenant Commander Read, with Lieutenant Walter Hinton as chief pilot), left Rockaway for Trepassy Bay, Newfoundland, on May 8, 1919. The fourth Navy ship had been disabled during tests and could not be repaired in time to join the others.

On May 16, after the planes had been carefully checked and rechecked, the flight took off for the Azores along a night skyway lighted by searchlights and star shells sent up by the ships on the surface. By six o'clock of the next morning, 650 miles had been covered from Trepassy.

At this point dark fog and rain set in, causing the seaplanes to lose sight of each other. The NC-4 continued

on its way and arrived over Ponta Delgada, but, finding weather conditions too dangerous for a landing turned back to nearby Horta, there ending the first leg of the voyage with 1,200 miles covered after 15 hrs. 17 min. of flying time.

The two other planes did not fare so well. The NC-3 was forced down into a sea running eight to twelve foot waves, and several engine struts were broken in landing. The craft was still seaworthy, however, so, undaunted by its inability to rise again, Commander Towers sailed the boat into Ponta Delgada three days later.

The most unfortunate ship of the trio was the NC-1. Also forced down, this flying boat was severely damaged. Commander Bellinger and his crew were rescued by the S.S. *Ionia* after having been adrift for six hours. An attempt was made to tow the plane to the Azores, but after eight hours it had to be cut loose and sank in mid ocean.

FOLLOWING a three day rest, the NC-4 hopped from Horta to Ponta Delgada, where another week was spent in preparing this single surviving ship for the flight to Lisbon. And on May 27, she took off and flew the 800-mile distance to the Portuguese city in 9 hrs. 30 min.

Thus these trans-Atlantic trail blazers of a new era completed their trip in the very city from which, four centuries before, the old Portuguese and Spanish explorers had set forth on journeys that were equally hazardous. However, the NC-4 did not long remain to receive the congratulations of the people of Lisbon, for Commander Read flew it northward to El Ferrol three days later.

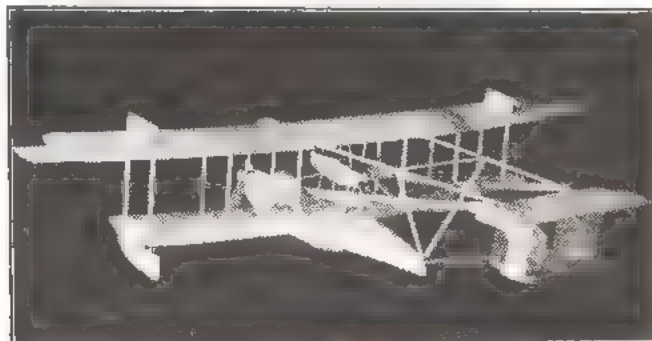
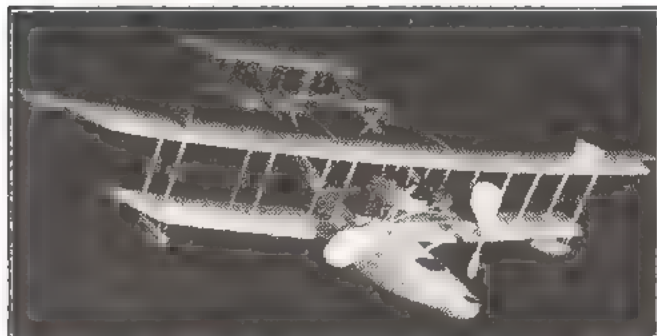
On the next day, (May 31) the last leg of the scheduled Navy route to Plymouth was flown, and the 4791-mile cruise was brought to a triumphant end. Fifteen days had elapsed since the start from Trepassy Bay and the time spent in the air was 53 hrs. 56 min. The average speed was 88 m.p.h.

OUR MODEL

IN model form, the NC-4 is most impressive, due to its wealth of detail and its size. In preparing the accompanying plans for this ship, we followed the usual Trail Blazer scale of $\frac{1}{4}$ " to 1' for ships having a wing-spread greater than fifty feet. The three-view (Plate 1) is half the size of the finished model. Plates 2 and 3 are full size.

To begin construction, lightly glue together the two

DON'T MISS
Trail Blazer No. 13
The Douglas 1934
"Round-the-World" Cruiser
In an Early Issue



Representing the 126' span of the original Navy-Curtiss NC-4, the 11 1/2" spread of Struck's flying scale replica, shown in the two pictures above, makes this a most impressive model. The scale is 1/4" to the foot. The absolute accuracy of detail which is evident here and which Struck secured from plans and photographs of the original ship, combines to make this "Trail Blazer Number Twelve" a most valuable addition to your collection of historic aircraft. The Navy's own ship carried four Liberty motors, two of them mounted tandem style within the center nacelle. For flying purposes, however, this model carries power in only the two outboard nacelles.

HERE'S NO. 12 OF OUR "TRAIL BLAZERS OF THE AIR"

Prominent among the ships that have made real aero history was the giant Navy-Curtiss NC-4, that unique flying boat which successfully completed a trans-Atlantic crossing nearly twenty years ago. Constructed primarily for the oceanic experiment, the NC-4 embodied many improvements in design which were the result of aeronautical experiences gained in the World War. And now we're offering you plans and instructions for making a model of this great ship, and these plans—following the lead of the Navy's original design—enable you to build this flying scale model so that it'll take off right from the water!

blocks of $1\frac{1}{4}$ " by 2" by 12" very soft balsa by their 2" faces. Trace the side view of the hull from Plates 2 and 3 and trim the block down to this outline. Follow the top view in a similar manner.

Carve the block to the proper cross-section, and finish it with successively finer grades of sandpaper. Split the hull apart at the glued seam and hollow out the inside to the thickness indicated by the broken lines on the drawings. Note that most of the front portion is left solid for balance and strength. Glue the halves together again, and cut out openings for the cockpit and bottom wing.

The three motor nacelles of $\frac{3}{4}$ " by $\frac{3}{4}$ " by 3" stock and the tip floats of $\frac{3}{8}$ " by $\frac{3}{4}$ " by $2\frac{1}{4}$ " very soft balsa are laid out and carved in the same fashion as the hull, except that due to their comparatively small size it is not necessary to hollow them out.

Apply several coats of clear dope to these parts, smoothing off with fine sandpaper between each. Finally, finish with two coats of thin grey dope.

WINGS

THOUGH the wings require sixty-two ribs, these are not as difficult to make as they may sound. Pin together sixty-two slats of balsa, each $\frac{1}{2}$ " by 3". Twenty-four should be of $1/16$ " sheet and thirty-eight of $1/32$ " sheet. Pin them all firmly. Shape the resulting block with knife and sandpaper to the airfoil section shown on Plate 2.

Assemble the wings by pinning the trailing edge strips on a full-size drawing. Cement the tip and center ribs in place. Then pin and glue the leading edge strips against the nose of these ribs, and add the remaining ribs and the sheet balsa tips. The lower wing is cracked slightly at each No. 5 rib and the tips raised $\frac{1}{2}$ " for dihedral. Reinforcements of $1/32$ " sheet are glued to the No. 13 ribs of the lower wing where the tip float struts are anchored (see Plate 3).

Sixteen slats of $\frac{1}{4}$ " by 2" balsa—four of them $1/16$ " thick and twelve of $1/32$ " stock—are pinned together for the tail group ribs. Carve this block of slats to a streamline airfoil.

The same procedure is followed in assembling the tail group as in assembling the wing.

COVERING AND ASSEMBLY

BEFORE covering, sand the entire framework to remove any bumps or bulges that may spoil the finish. Using dope for adhesive, cover all framework except the

two large rudders with yellow tissue. On the rudders, use white.

To produce a solidly built job, always scrape away the tissue to assure a wood to wood contact before cementing any part in place. Begin assembly by slipping the lower wing into its cutout in the hull. Cement it in position after carefully checking its alignment in all directions.

Streamline a length of $1/16$ " by $\frac{1}{8}$ " very hard balsa and cut from it eight struts, A, $1\frac{3}{8}$ " long. Sharpen one end of each and force into the center motor nacelle. Glue this unit to the No. 1 ribs of the lower wing.

When dry, mount the top wing at the same incidence as the lower and recheck the alignment of the assembly thus far.

The interplane struts, B, of $\frac{1}{8}$ " by $3/16$ " streamlined balsa, can now be fitted in place. Dummy radiators are cut from $\frac{1}{8}$ " sheet balsa and cemented to the front of the three nacelles.

Drill the two outboard nacelles for the prop shafts. To

each, cement a washer with a bushing to the front and a bushing in the rear, to serve as bearings. Force pairs of V-struts—C, $1\frac{5}{8}$ " long, and D, 2" long—of $1/16$ " by $\frac{1}{8}$ " very hard streamlined balsa into the nacelles.

Mount these units on the No. 4 ribs of the lower wing. Brace the structure with the transverse members, E and F, of similar size streamlined balsa.

The main tail booms, G, of $1/16$ " by $\frac{1}{8}$ " bamboo, are pointed and forced into the top wing cutout at the No. 5 ribs. A triangle of $\frac{1}{8}$ " by $3/16$ "

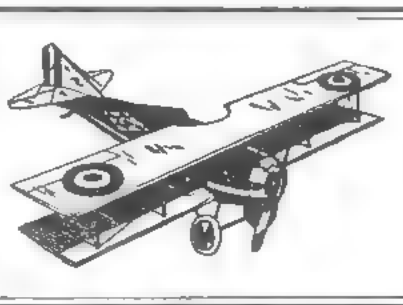
streamlined struts, H, is cemented to the booms with its apex atop the stern of the hull. Sharpen the rear ends of the booms and force them into the leading edge of the upper stabilizer.

Hang the rudders in position and add the lower stabilizer. Brace the tail group by a $1/16$ " round bamboo interplane strut, I, and by the short tail boom, J, of $1/16$ " by $\frac{1}{8}$ " bamboo.

Struts L, of $\frac{1}{8}$ " by $3/16$ " hard balsa are used to brace the lower wing to the hull. The tip floats are attached to their reinforcements in the lower wing by struts M, of $1/32$ " round bamboo $\frac{3}{4}$ " in length. Cement the overhang cabanes, N—of $1/16$ " sheet—atop the No. 13 ribs of the upper wing.

Spray the surfaces lightly with water to tighten the tissue. Apply a coat of clear dope when dry.

(Continued on page 71)



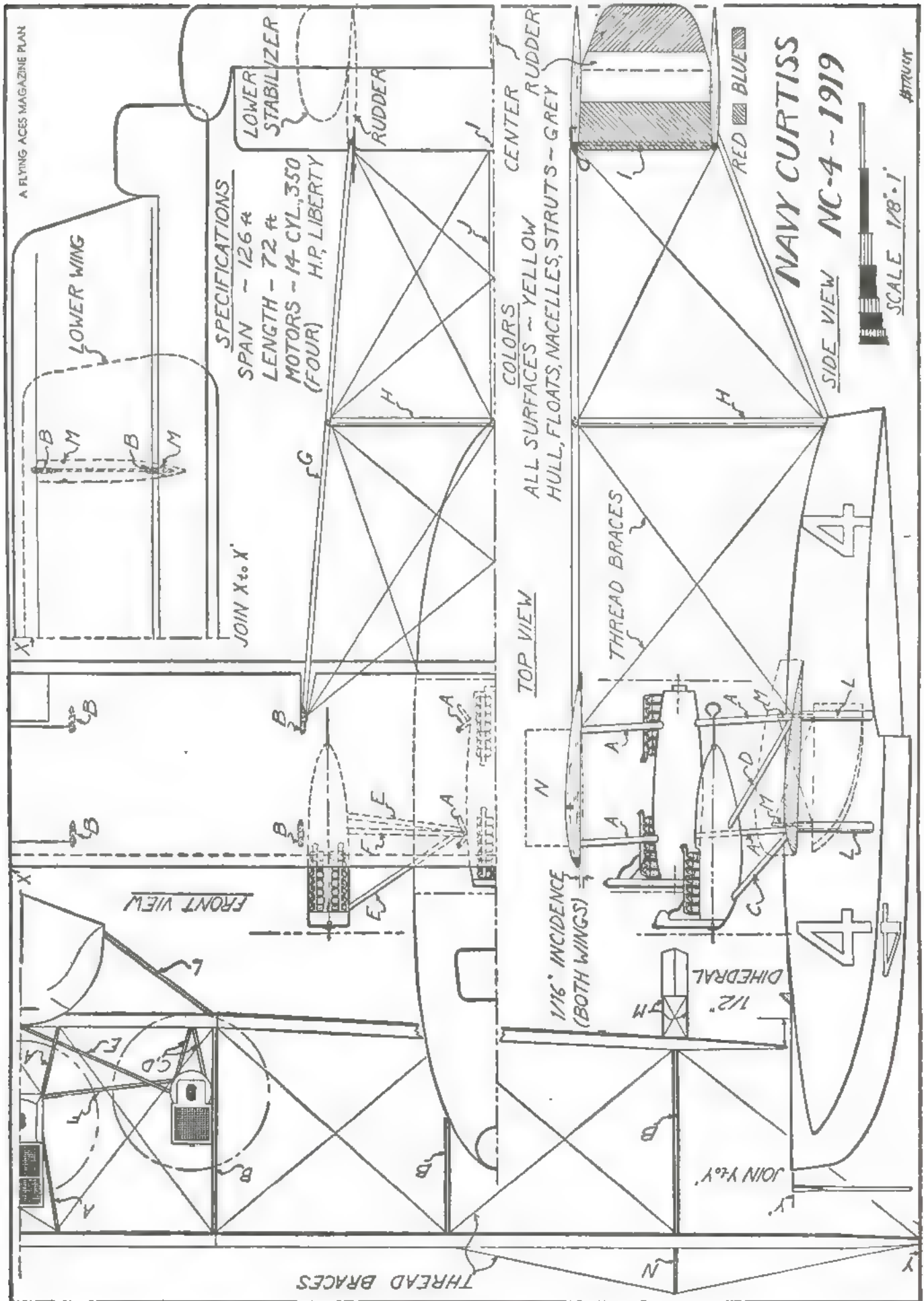
Bill of Materials

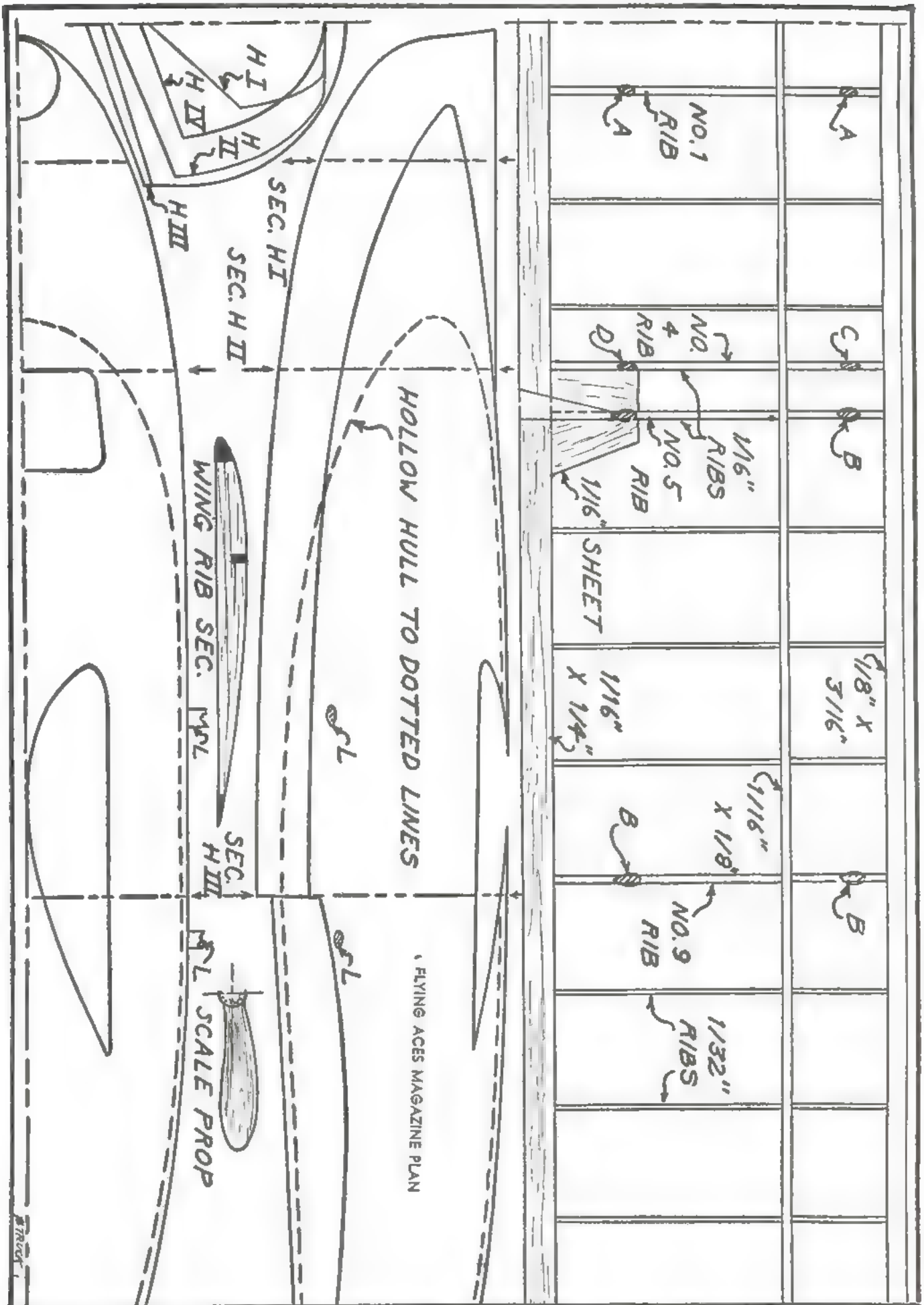
Complete plans will be found on the following pages

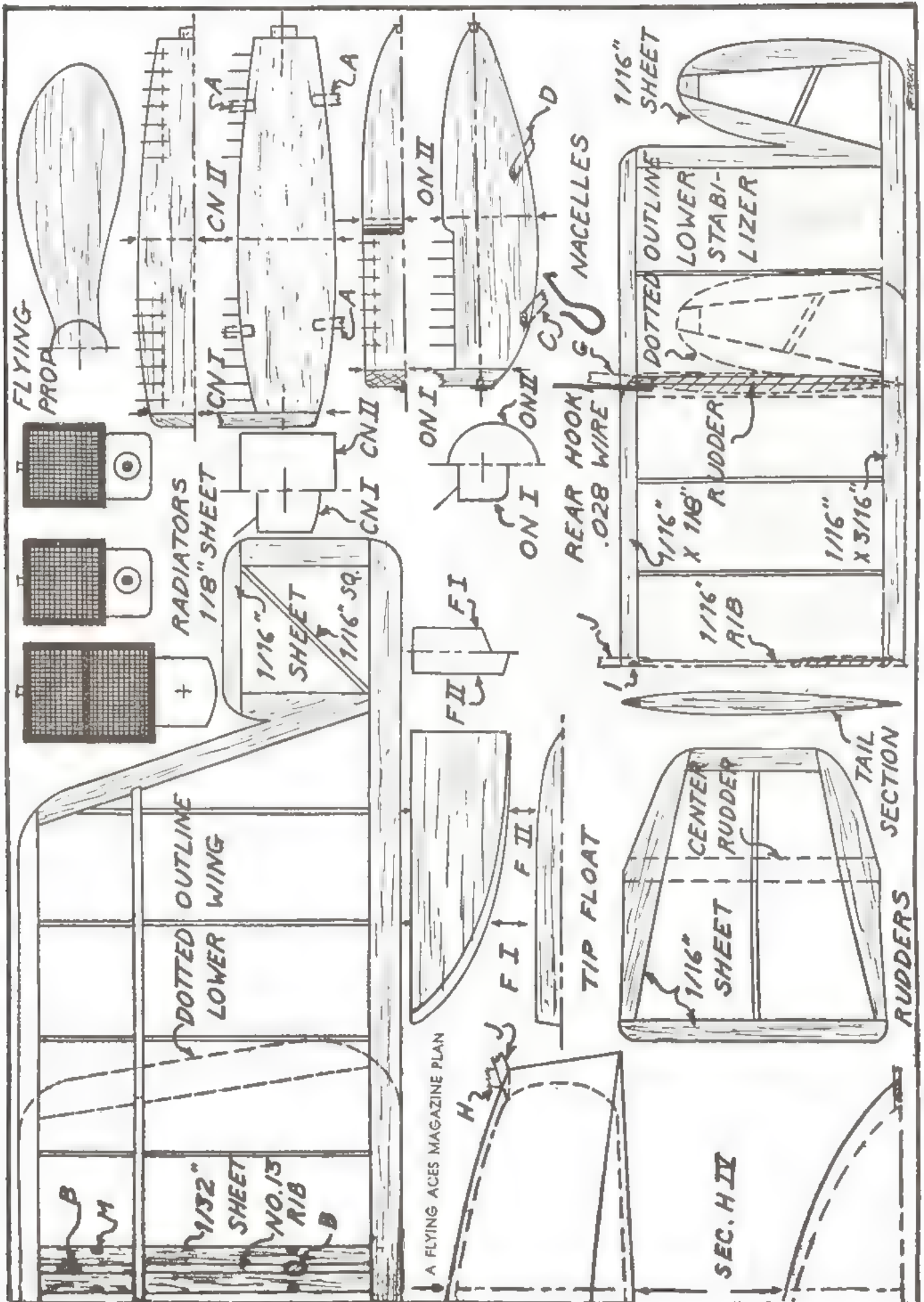
One piece $1/16$ " by 2" by 18" soft balsa;
Two pieces $1/32$ " by 2" by 18" soft balsa;
Six pieces $\frac{1}{8}$ " by $3/16$ " by 18" hard balsa;
Four pieces $1/16$ " by $\frac{1}{8}$ " by 18" very hard balsa;
One piece $1/16$ " by $3/16$ " by 18" medium balsa;
Two pieces $1/16$ " by $\frac{1}{4}$ " by 18" medium balsa;
One piece $\frac{1}{8}$ " by 2" by 2" medium balsa;
Two pieces $1\frac{1}{4}$ " by 2" by 12" very soft balsa;
Three $\frac{3}{4}$ " by $\frac{3}{4}$ " by 3" very soft balsa;
Two pieces $\frac{3}{8}$ " by $\frac{3}{4}$ " by $2\frac{1}{4}$ " very soft balsa;

Two pieces $\frac{5}{8}$ " by $\frac{7}{8}$ " by $4\frac{3}{8}$ " medium balsa;
Two pieces $1/16$ " by $\frac{1}{4}$ " by 15" bamboo;
One foot .028 piano wire;
One sheet yellow tissue;
Six feet $\frac{1}{8}$ " flat rubber;
Grey silk thread;
Four bushings, eight large washers;
Two ounces cement;
Two ounces clear dope;
One ounce grey dope.

BUILD THE TRANS-ATLANTIC NC-4—Plate 1







Gas Job Gossip

Including Lists of Winners in Recent Important Meets

By Phil Zecchitella

NO FOOLING, gentlemen, this model meet reporting game is a strenuous business! First came that pleasant-sounding assignment of a leisurely jaunt to Detroit to cover the Nationals. And as if that weren't enough, we have just survived two more rip-snorting model flying jamborees—and were *they* the berries!

Well anyway, we have variety this season. An innovation has been the entry fee which, even if it does put a pinhole in some pockets that would even starve a Scottish moth, nevertheless gives one the professional feeling of participating in a six-day bike race or a bingo brawl. We think that's a healthy feeling, though, on account of some people aren't tickled a snap about anything that isn't strung with an obvious price tag!

But when it costs them a dime or two—then, by cracky, we discover they stay awake nights and act as though they're making the Louisiana Purchase. And one little floppola in the routine of the contest, and we also discover that we have something like a Congressional Investigation on our hands—all because of that entry fee

One of these "fee meets" was held recently at Miller Field, Staten Island, New York, when the Richmond Model Flying Club held its annual gas model meet. The entry fee was two bits, and there were four events: Endurance with a 20-second motor run, payload with 20-second motor run, a stunt event, and finally—believe it or else—a beauty contest!

Event No. 1 was won by Leon Shulman, of the T.A.M.B.E. Flying Club, of Brooklyn. His average time was 7 min. 45 secs. For this he received a Brown engine.

Event No. 2 was won by Arthur Koslow, of Perth Amboy, with a 9 min. flight. He too received a Brown.

Event No. 3 was won by Richard Boegehold, of Verona, New Jersey. This was the stunt event. Dick's idea was a model which, in flight, dropped a parachute and confetti. For a prize, he received a model kit. The second place winner in the stunt event was Joseph Raspante, who, taking his trick from the current headlines, rigged up atop his gas model a tiny rubber powered plane. In mid-air, the self-timer for the engine operated to launch the rubber job

We'd hate to think, dear readers, of Mister Zecchitella ever losing his power of speech, or mayhap becoming crippled in his typewriter finger. For, deprived of its usual outlets, the pressure within him would build and build — and build. And Mister Zee would then either become a walking example of an internal combusticating engine—or else he'd blow completely up. But thus far Phil seems to be safe, for here he is again with a resume of his recent modeling observations.

So—steam on, Phil!

in flight in pic-a-back fashion!

THE "GREAT SMOKING MOUNTING"

ONE "inspired" entrant in the stunt event had an idea for a smoke screen. But considering what the officials were subjected to—and that all nearby gas masks were locked up in the army hangar down the field—it's no wonder that even the army men (they were the officials) were not too favorably impressed with the demonstration.

Our guess is that the lad had the odds against him, because actually the smoke screen, when the model was in flight, developed into a faint suggestion of perhaps simply too much oil in the gas

mixture. Now when an army flier is promised a smoke screen, by golly he *expects* a smoke screen!

The first disadvantage was that the smoke had to be started before the model was ready to fly. Looking from where we were (and that was a safe distance, we'll have you know!), we noted a group of army timers around the model while the modeler was trying to get a whiff from his generator, or whatever the smoke came from. Suddenly he seemed to get what we might call results—and in no time at all the whole group was enveloped in a gushing cloud of dense white smoke! It was a riot!

For a minute or two it looked as though the Government was going to start paying a couple of more pensions, when suddenly out of the bedlam there appeared a scrambling group of uniforms. They were followed a few seconds later by the frantic modeler dashing like a scared rabbit with the model in his hands (*Why Phil! You know that rabbits don't have hands—Editor*) and trying his darndest to push it into the air.

Well, into the air it did go. And the "smoke screen"



Right: Lined up here are the prize winners in the recent Mississippi Valley Meet held at St. Louis, Mo. Left to right, they are: Craig, Goldberg, Grouard, Marguardt, Hedrick, Wriston, Seltzer, Lueke, and Contest Director Bob Sommers. The uniformed fellow at the right, who apparently isn't sure of his status among these outstanding modelers, is Jim Malone, test pilot for Chicago and Southern Airlines. (Photo by Schmid and Hays)

thinned out to a haze trying desperately to keep up with the 25-mile pace of the model. We felt sorry for the modeler—but then again, we felt sorry for the army, too.

Soldiers of the No. 1 Tank Company, U. S. Army, Miller Field, acted as timers and judges. They were as follows: Staff Sergeant Ware, Corporals Jones, Madden, Zykowski, and Gotzheim and Private W. V. Davies.

The contest was the second annual held by this club and more than 125 gas models were entered. William Nott, president of the Richmond Model Flying Club and a familiar figure at all gas meets in this end of the country, was director of the contest and radio announcer.

Following are the winners in the various events: *Endurance*—Leon Shulman, of Brooklyn, N. Y.; Magnus Anderson, of Staten Island; Marcel Traiman, of Brooklyn. *Payload*—Arthur Koslow, of Perth Amboy; Anthony Bacchi, of Brooklyn; Gordon Murray, also of Brooklyn. *Stunt*—Richard Boegehold, of Verona, N. J.; Joseph Raspante, of Brooklyn. *Beauty* (which really was a display affair)—Joseph Raspante, of Brooklyn.

LAWN PARTY—OR MODEL MEET?

ANOTHER gas tourney with lots of action was the recent Second Annual Eastern States Gas Model Meet sponsored by the Trenton Senior and Junior Chapters of the National Aeronautic Association. (This Eastern States contest, by the way, is not to be confused with the original Eastern States Meets held annually at Hadley Field over the past few years.)

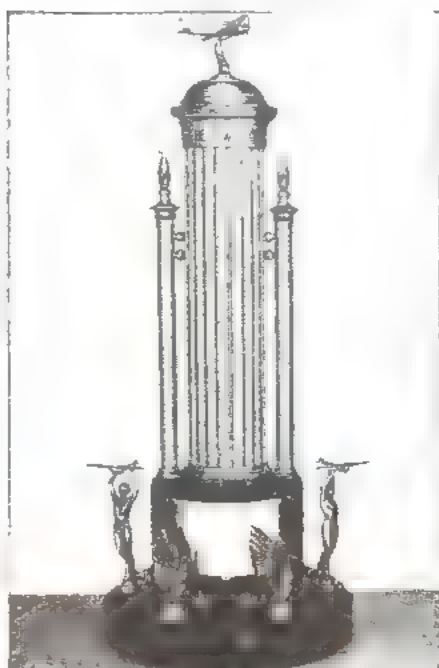
The locale for the Trenton meet was Mercer County Airport, a private airport operated by Luscombe Aircraft and managed by Werner Newhouse. The weather and the terrain were as beautiful a combination as we've ever seen. The flying grounds were in the shape of a natural bowl. The entire flying program could be viewed by spectators without leaving their cars. This contributed greatly to the orderly manner in which the meet was run off, for, as a rule, the greatest source of confusion is the unruliness of spectators barging in and out of groups preparing planes for flight.

The honorary sponsor for the meet was Col. Mark O. Kimberling, chief of the New Jersey State Police. The trophy for the main event was also given by Col. Kimberling. The contest was directed by Lieut. Everett C. Plummer, of Colonel Kimberling's force. And Lieutenant Davis, of the Trenton Police Department, was also present with a safety sound car.

It was a novel experience to have Troopers in gay uniform directing a meet. And they did the job so ably that the affair took on the aspect of a lawn party on an airport with a flock of models just flying around "incidentally."

Maybe it was the weather, but never in all our experience at contests have we seen so well-performing a group of models. The boys would simply start the engines and flick an arm, and the models would scamper smoothly into

Natty "Nationals" Trophy!



Presented for the first time at the Nationals, the 34" Megaw Trophy, shown above, was won by the Edith Van Orman Junior N.A.A. chapter, of Akron, as the "most active club group" in the meet. And now we're wondering what outfit will take it home from the 1939 affair!

the air and head for altitude.

Jimmy Condon was present with a Scientific *Eaglet* powered with a Shershaw *Bantam* engine. Jimmy flew his ship all day, making nearly 40 successive 30-second engine-run flights without a sign of balkiness on the part of the engine or the model. The small engine models were numerous.

But lest we forget where we were, here are the winners in the Trenton events: *Consistency of flight*—Magnus Anderson, of the Richmond Model Flying Club; John Findra, Jr. *Endurance* (30-second engine run)—Magnus Anderson, 12 min. 18 sec.; John Findra, Jr., 4 min. 26 sec.; William Deans, 4 min. 21 sec.; Joseph Mastrovitch, 3 min. 48 sec.; H. M. Fitcharies, 3 min. 41 sec.; Larry Low, 3 min. 20 sec.

Design and Workmanship—Larry Low, Walter Marienschek, Henry Struck.

A very gracious gesture was the "Lucky Winner" event, in which all those that didn't place were represented by a little card in a box, and a winner was drawn. The Lucky Winner was Ed Seegmuller, who received a pair of air wheels for just nothing at all! And if we're not mistaken, Seegmuller is the chap picked by *Life* magazine for a photo representing the "typical gas modeler" in their photo review of the gas model game a few months back.

SUCCESSFUL "NO RECORD" AFFAIR

IN CONTRAST to the Trenton Meet, models crashed one after the other at Parks Airport in St. Louis on Sunday, August 14. Here, in the face of a 20-mile wind, 328 model fans competed for 52 prizes in the Sixth Annual Mississippi Valley Model Airplane Contest. The affair was sponsored by the Stix, Baer, & Fuller Department Store, the Young Mens' Division of the Cham-

ber of Commerce, and Parks Air College, all of St. Louis.

Crashes were 50 per cent greater than in previous years! And because the strong wind didn't calm down until late in the evening, no records were broken. Yet all in all, the meet was highly successful and Contest Director Bob Sommers (who, incidentally announced his engagement on the same day) may be proud of the results. Contestants arrived from Arkansas, Tennessee, Iowa, Florida, Wisconsin, Illinois, and other states.

Carl Goldberg, winner of a Flying Aces Trophy at the Nationals, won the gas model endurance event when his plane remained aloft for 2 min. 22 sec. Karl Schuenke, of Milwaukee, was second, and Frank Nekimken, of Chicago, rated third.

The performance contest, judged on Take-off, Flight, and Landing, was won by Roy Marquardt (designer of the *Dinky \$-Demon* in October F.A.), of Burlington, Iowa. Jack Reed, of Mattoon, Ill., was second, and S. R. Jackman, Little Rock, was third.

This performance test was something entirely new, and before explaining it we would like to startle you with the possible results of a flight in this event. Let us assume your model flies in this manner—you launch it, and it requires help in getting off the ground. But even then it ground loops and finally gets into the air after traveling more than 75 feet. Just after the take-off it begins to stall, goes into a mushy climb, and finally a tight spiral. In so doing, it comes to a landing over the boundary previously established, breaks the prop, turns over, and bends the landing gear. (Editor's note: We'd just like to interpose here that such a model couldn't possibly have been built from F.A. plans!)

Well, now, according to that flight, you are penalized a total of 105 points!

And now for an explanation of this performance event. There are three point units: Take-Off, Flight, and Landing. On the take off, the following points may be deducted: For assistance in getting the model off the ground, 5; if it ground loops, 10; if it gets off in more than 25 feet, 5; more than 50 feet, 10; more than 75 feet, 15.

On the flights, points may be deducted for: A stall, 15; a mushy climb, 10; a tight spiral, 5.

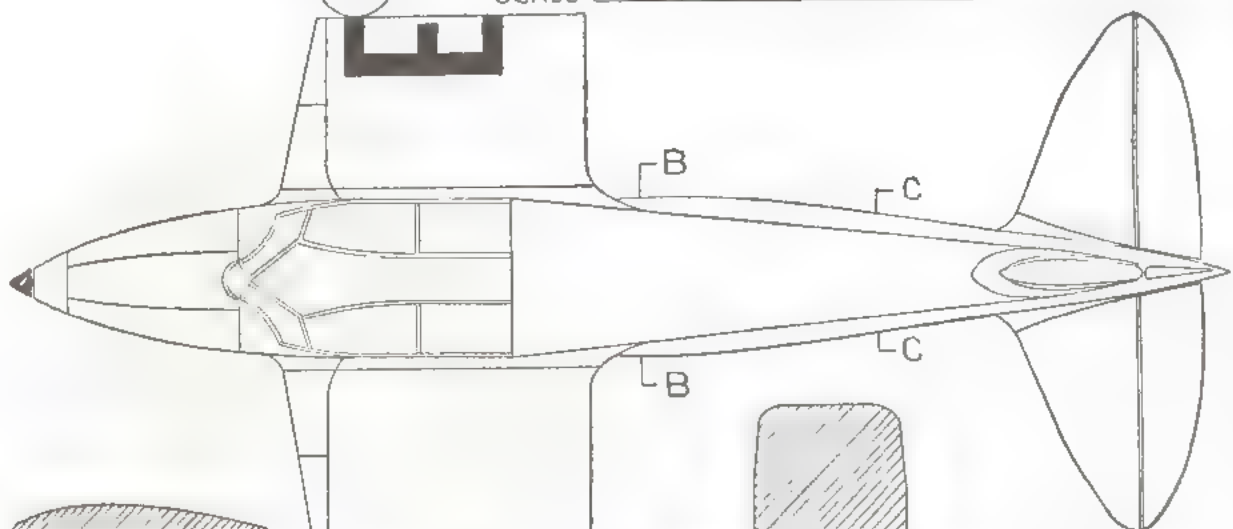
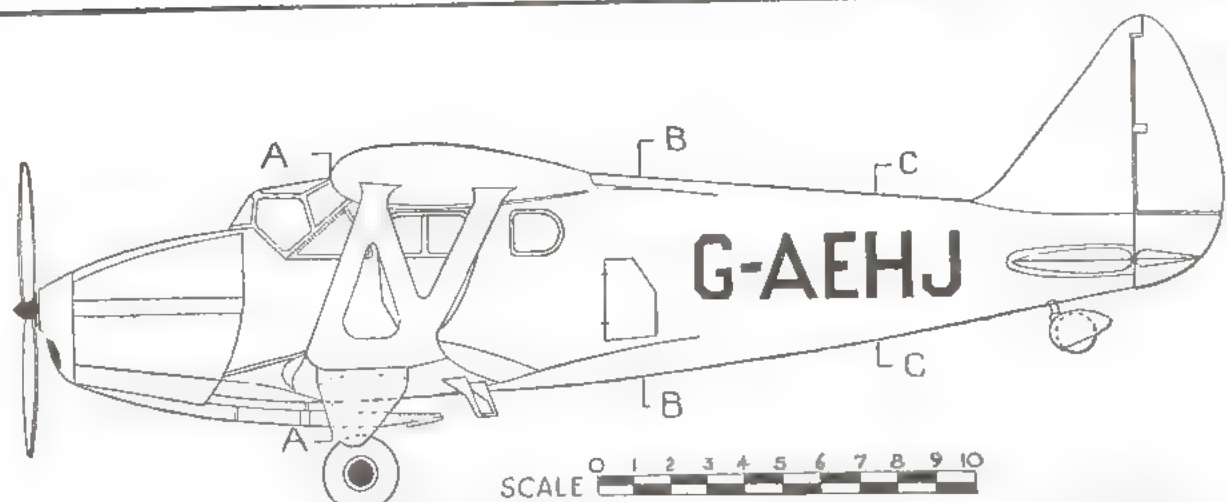
For the landing, the following are the penalties: over the boundary, 15; broken prop, 5; bent landing gear, 5; and a turn-over, 10.

The flight time is taken in seconds and divided by four. The result is the total from which the deductions are taken. There are two flights allowed, and the total of both represents the point standing. So on this basis, your freak flight must run 6 min. 10 sec. to bring your score up to zero!

A special prize was given to the contestant who had the most outstanding development in design, regardless of type. The award was given to Donald Lucke, of St. Louis. David Seltzer, also from St. Louis, won the Stix, Baer,

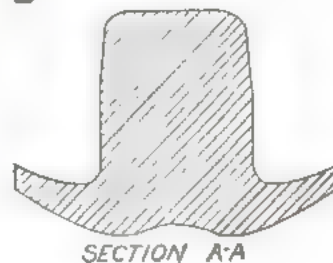
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CARVE OUT A HESTON "PHOENIX" SOLID

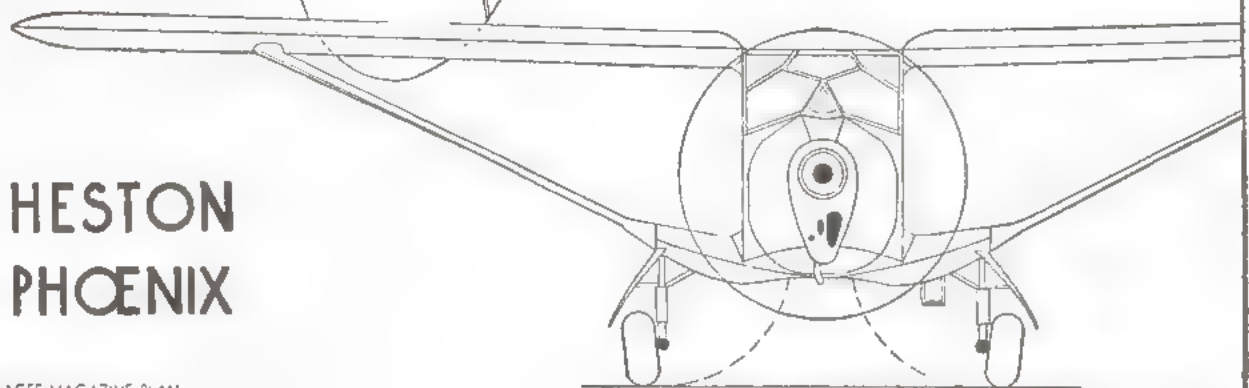


SPAN --- 40' 4"
 LENGTH --- 30' 2"
 HEIGHT --- 8' 7"
 MAX SPEED --- 148 MPH
 CRUISING --- 125 MPH
 LANDING --- 55 MPH
 CLIMB --- 700 FPM
 CEILING --- 15,500'
 RANGE --- 500 MI

G-A



HESTON
 PHOENIX



PRESENTING THE ABRAMS EXPLORER

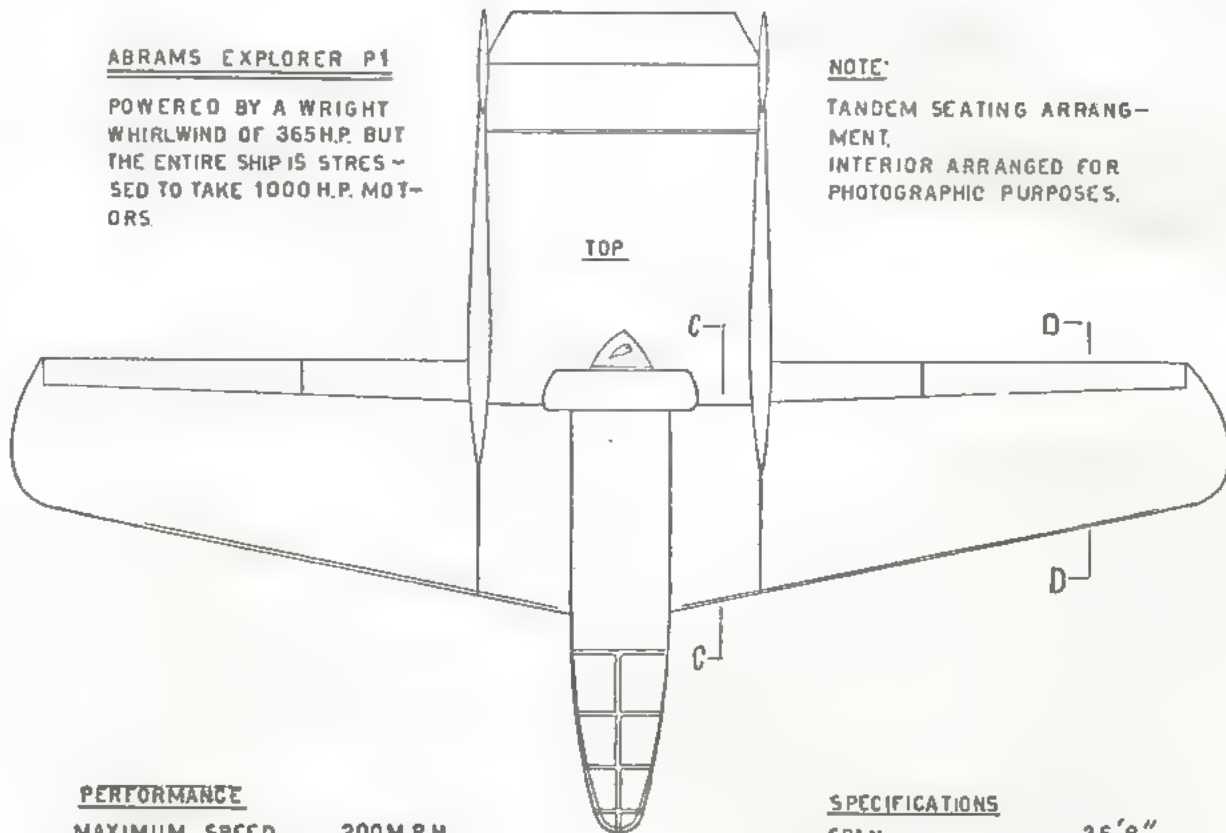
A FLYING ACES MAGAZINE PLAN

ABRAMS EXPLORER P1

POWERED BY A WRIGHT WHIRLWIND OF 365 H.P. BUT THE ENTIRE SHIP IS STRESSED TO TAKE 1000 H.P. MOTORS.

NOTE

TANDEM SEATING ARRANGEMENT, INTERIOR ARRANGED FOR PHOTOGRAPHIC PURPOSES.

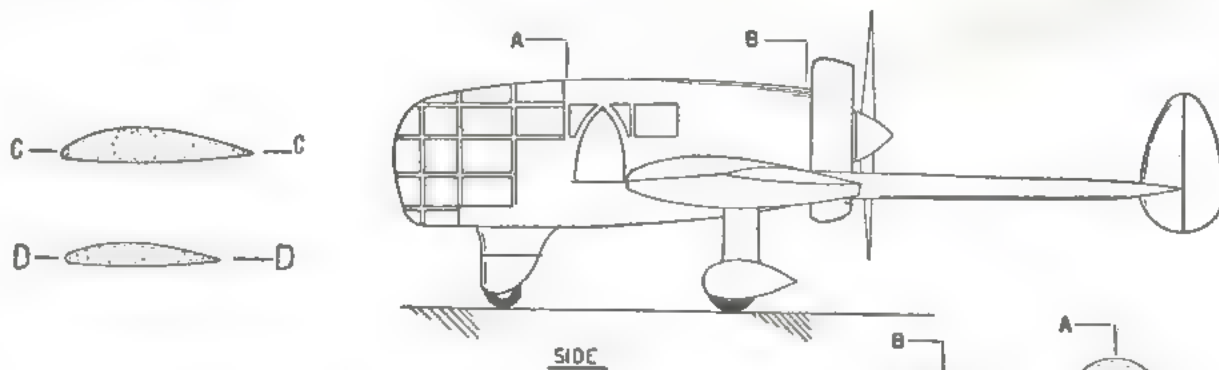


PERFORMANCE

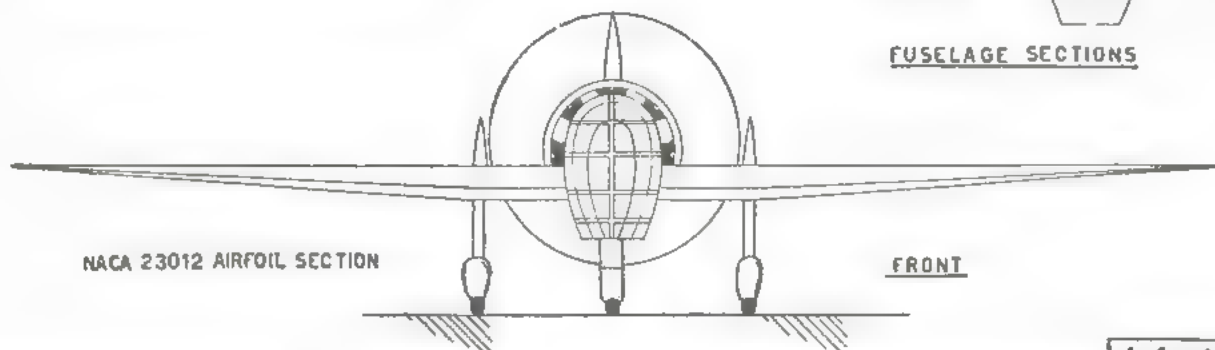
MAXIMUM SPEED — 200 M.P.H.
CRUISING SPEED — 175 M.P.H.
LANDING SPEED — 60 M.P.H.
SERVICE CEILING — 20,000 FT
RATE OF CLIMB — 1400 FT/MIN.
CRUISING RANGE — 1200 MI.

SPECIFICATIONS

SPAN — 36' 8"
LENGTH — 26' 6"
WING AREA — 200 FT²
WING LOADING — 17 LBS/FT²
EMPTY WEIGHT — 2100 LBS.
GROSS WEIGHT — 3400 LBS.



COLOR SCHEME: SILVER OVER ALL



S. Strubbe 2/38

From the Model Builder's Workbench

• • •

WIRING AND WINGS

NO gas model will fly well if the motor is only half running because of bad wiring. By incasing the spark plug lead-in wire in rubber tubing, you can prevent oil from soaking in and short circuiting the wire.

A drop of glue every few inches in the body will help hold the wire in place and keep the wiring in good order. Clean, solder, and wrap carefully with tape all joints, and your motor will always be in flying trim.

To be on the safe side use two separate sets of rubber bands to hold the wing on, so that if one breaks, the other will hold until the model reaches the ground.

If your wing struts are held on by bolts and they tend to loosen while in flight, prevent this by cutting a hole in the center of a short length of tape, putting the end of the bolt through the hole, and sticking the tape on the surface of the wing.

C. FLETCHER WARREN, JR.

COWLS FOR SMALL SOLIDS

A GOOD way to make cowls or drag-rings for small or medium sized solid models makes use of old flash-light batteries. All the tools needed are a sharp knife and a couple of files—a round one and a flat one.

For a drag-ring, cut off the bottom of the battery about a quarter-inch up. Then with a knife, scoop the contents out of the bottom piece. Next cut a hole in the bottom just a bit bigger than the round file, then file the edges of the hole down to about 1/16" from the outside of the "cowl." Use the flat file to smooth the back.

For an open-faced cowl, follow the general directions above, but cut the

battery off at about 1/8" instead of a quarter. File the front end out to make the edges come down to about 3/32" from the outside edge instead of 1/16".

To make an extra small cowl use pen-light cells. Cowls made in this manner can be painted or doped to a very fine finish.

—RALPH ANDRUS

TOW-GLIDER TRICK

TO drop the thread from a model glider is sometimes difficult. Here's a trick, though, that works quite nicely.

Attach a thrust bearing to the nose of the glider as on a stick job. Remove some of the balance weight from the nose if you need to. Then tie one end of a 200' length of tow-thread firmly around the head of a pin.

Insert the point of the pin into the thrust bearing from the rear and pull the thread over toward the front for towing. When the glider is in the air and has reached an overhead position, merely run backward a few steps—and the pin and thread will slip out.

—CECIL DUNCAN

Logging the Model Market

• • •

(Readers desiring further information on any of the items described in this department are invited to write direct to FLYING ACES Magazine, mentioning the items in which they are interested and the names of the manufacturers. And companies adding new goods to their line are also invited to notify Mr. Limber, who will be glad to describe the products. Send him full facts in care of this magazine.)

Models Mikolv, an organization specializing in supplying plans of airplanes and equipment, has added to its blueprint line scale drawings of the Spandau machine gun. The blueprint is 14" by 20" in size and is neatly as well as accurately executed. Inquiries regarding plans offered or prepared by the company are welcome.

G.H.Q. Motors, Inc., has prepared a new instruction sheet which simplifies assembly and operation of the company's gas engine kits.

A new steel piston has been designed for the engine. It is extremely durable, says the manufacturer, and weighs only

eight grams as against 13 grams for the cast iron piston previously used. Easier starting, lower gas consumption, and higher power output result from the new piston's high compression head, the company states. The pistons are centerless ground to within .0002 of an inch and are carefully matched to the cylinders.

Comet Model Airplane and Supply Company recently announced several new items, among them being propellers up to 16" in diameter and a new "senior" R.O.G. kit for a model with 25" span. Also on the production line are streamlined balsa wheels of 1 1/2" and 3" size.

For the gas modeler, Comet designers have developed a light weight timer adjustable from 10 to 50 seconds. It weighs one-half ounce, and its retail price is 50c. Three sizes of rubber "donut" wheels ideal for gas model tail wheel use are also available now. Price and sizes of the latter are as follows: 1" diameter at 10 cents per pair, 1 1/4" diameter at 15 cents per pair, and 1 1/2" diameter at 20 cents per pair.

—NICK LIMBER.

HERE'S THE "FLIGHT PLAN" for the NEXT SMASHING NUMBER OF FLYING ACES



FACT—"Science Wipes Danger From the Skies!" A special foto-packed feature by Lieut. H. Latane Lewis II revealing the "why" and "how" of a batch of striking new air-safety inventions "Can Britain Hold Gibraltar?" Don't miss this dramatic cover painting and article exposing the threats to England's "Life Line."

And the exciting ninth session of our popular Jack Conroy flying course.

FICTION Dick Knight, the skyman without a country, in a smashing Canal Zone spy novel. "Crash" Carringer hurtles his Hale Hellion into a new tracer-slashed air mystery. Plus "Don Patrol"—which finds Phineas tangled in a wartime Spanish omelet.

MODEL BUILDING—The Kiltie Biplane—one of the sleekest flyers we've ever offered. Our F. A. Midget Trainer. Jockey its joystick and learn how to fly! Another ace-high gas job. And many other swell features.

In February FLYING ACES

On Sale December 27th (Canada One Week Later)

FLYING ACES

Falcons of the Four

JANUARY, 1939

(Continued from page 6)

until he was admitted to rival Knight as the leading American authority on foreign aviation. Rigid in discipline, almost a Puritan in his stern personal life, his intolerance of more easy-going men had made him a lonely figure, avoided by almost everyone except when official business forced otherwise.

"This business is getting too mixed up for me," Doyle complained as Knight locked the wheels in position. "Who do you suppose that bird in the P-26 was?"

"That's what I want to find out," said Knight. "Fortunately, the wreck didn't burn. If we hurry, we may be able to get to it before anybody else."

He landed, braked the two-seater to a stop close to the tangled wreckage of the fighter, but an ambulance and a crash truck careened across his path as he pivoted out of Hart's way.

Hart's A-18 had landed and circled around on the other side of the crash, and when Knight and Doyle reached the scene, the stern-faced defense expert was already out of his ship, leaving his gunner at the controls.

"Thanks for pulling us out of that jam," Knight began.

But Hart cut him short. "You owe me nothing, Mr. Knight! I was after this traitor-devil in the P-26. If I aided you, it was purely coincidental."

Knight flushed.

Then Hart turned his cold blue eyes on Doyle. "And if it hadn't been for your blundering in, I'd have had the man down here alive."

"Why, you fat-headed grampus!" roared Doyle. "I saved *you* as much as you saved *us*. He was all set to knock you off."

"I can take care of myself," Hart said icily. He shouldered past the two men, stalked up to the side of the crashed fighter as the ambulance crew lifted out the pilot.

Blood from a hideous gash covered part of the dead man's face. Hart coolly took out his handkerchief, swabbed away the blood until he could see the pilot's features.

"McGowan!" he said savagely. "I might have known it—always dissipating—drinking—late hours—gambling. It's obvious he sold out to them—whoever they are."

His tirade was interrupted by the arrival of a group of officers in a car from Operations. Knight motioned to Doyle as he recognized the erect, military figure of General Brett, Intelligence chieftain and a personal friend of long standing. Brett's kindly face had a tired look as though from lack of sleep, and his usually trim gray mustache was ragged and unclipped.

"Dick! What happened here?" Brett said in an undertone as Knight reached him. "We just arrived as the P-26 cracked up."

"I've something queer to tell you," Knight said in an equally lowered voice. Brett stepped out of earshot of the other officers, and Knight hastily sketched the strange events which had

occurred. The general looked at him in amazement.

"Then that O-47 pilot wasn't raving after all! We just got a flash, on the short-wave in my car, reporting what he told the C.O. at Langley. They were going to put him in a strait-jacket."

"He's sane, all right," Knight said gravely. "You can ask Doyle here—"

"It sounds screwy, General," Doyle cut in. "But it sure happened just the way Dick said. One second there wasn't a damn—my mistake—there wasn't anything there. The next, that blue cloud just spread out, from nowhere."

"Now we know what happened to the P-26's," Brett muttered. But Knight shook his head.

"That's the way I figured at first—but this changes it." He pointed to the crash. "The pilot was Steve McGowan, from Langley and from the way Hart acted I think he was one of the missing men."

"McGowan—here?" Brett exclaimed. Then he saw the covered body on the ambulance stretcher. "You don't mean he was the one who attacked you?"

"It's hard to believe—but it's the truth," said Knight. "That means he's been hiding out during these three days; and if his ship wasn't destroyed by one of the blue clouds, then perhaps the others weren't, either. They may be hiding out, too."

"But why—and where?" demanded Brett. "We've combed the coast for five hundred miles. And there's no reason for—"

"General Brett!" said a harsh voice. Justis Hart strode up, ignoring Knight and Doyle. "This development changes our theory about the missing flight. I'd like to call a special conference for tonight to discuss this new angle."

"A conference was ordered three hours ago," snapped Brett, "for the purpose of acquainting Knight and Doyle with the situation. By special order of the Secretary of War, Knight is to be in charge of the investigation."

THE muscles in Hart's jaw tightened.

"According to executive order, I'm the senior man on the Defense Board. I don't intend to have any Hairbreadth Harry going over my head."

"That's enough," Brett said with a grim finality. "The order has the approval of the White House. If you don't like it, you can resign from the Board."

"Very well, sir," Hart said stiffly. "I'll meet you at the conference."

"The meeting will be held as soon as we can get there," Brett told him. "One moment," he added, as Hart started to leave. "Did you learn anything at Norfolk?"

"I ran down the report that a tramp steamer crew had seen a P-26 flying out to sea. There's no doubt that they saw some kind of a plane, and it was at approximately the hour when the flight disappeared. But their descriptions were not very clear. I discounted their story—until I saw McGowan's ship attack Mr. Knight. Of course, I

tried to cripple the fighter and force it down so the pilot could be questioned—but Mr. Doyle's enthusiasm ran away with him."

"I suppose you'd have sat there and let him shoot you down!" snorted Doyle. "I didn't notice you handling him with kid gloves."

"Enough of this wrangling," General Brett broke in. "The man's dead, and arguing won't change it. Hart, has the body been searched?"

"I saw to that, naturally," the defense expert said with a frigid voice. "There were no clues that would help us." Thereupon, Hart climbed into his ship and sent it rolling toward the hangars.

Brett looked after him sourly. "There's a case where ambition has curdled the milk of human kindness—if he ever had any."

"He's a hard man," admitted Knight. "Yet you've got to admit he's done a good job tightening up on our air defenses. He's conscientious enough about that to make up for his faults."

"Maybe so," said the general. "But I still don't like him."

"I'd like to bounce my fist on his jaw," growled Doyle.

"You'd probably break your hand," Brett said with a dry smile. "If his face is as hard as it looks, that name 'Old Stony' would apply more than one way. And now, Dick, you'd better taxi your ship into our special hangar. I'll meet you with my car at Operations. Incidentally, Benita is with me. She's been helping on this case."

Knight looked dismayed. "I thought you weren't going to let her do any more G-2 work, after that close call she had last time."

Brett gave him a wry glance. "When a girl as pretty and determined as Benita sets her mind on something, you might as well give in gracefully. Seems to me she proved that to you a couple of times since you met her."

"Um—well, I'll see you at Operations," said Knight.

AS HE TAXIED the ship in to the line, his mind went back to what Brett had said about Benita Navarre, the beautiful Spanish *señorita* whom the newspapers in the Fall of '36 had called the "Girl from Lost Valley." Doyle and he had rescued her and others of a lost Spanish settlement from a Rocky Mountain canyon in which, imprisoned, they had lived all their lives.

Benita's great-grandfather, the Duke of Navarre, had established a small community there after finding gold back in '49. An earthquake had closed the only exit, and until a few years ago the descendants of the lost Spaniards had lived in the isolated valley, unable to scale the precipitous cliffs and entirely in ignorance of the modern world.

Since then, as a ward of General Brett and his wife, and with her share of the ducal fortune to aid her, Benita had quickly adjusted herself to modern ways, though there were still times

when she showed a naive surprise at some new discovery.

During the two years, Fate had several times brought her into the tangle of espionage which was Knight's constant life, though he passed in Washington as a well-to-do idler, sportsman pilot, and globe-trotter, with Doyle as his sidekick. To Knight's dismay, Benita had developed a passion for the plots and counterplots of international spying, and now it seemed that Brett was finally agreeing to her request to become a special agent of G-2.

But five minutes later, when he saw her waiting with Brett beside a War Department car, he forgot his worry for a moment. The snow had powdered her furs and her smart little fez hat, and in the lights her profile showed delicate as a rare old cameo.

Her dark eyes lighted up at sight of him. "Deek! I was so afraid when I saw the crash—I thought it was you and Doyle."

Knight smiled down at her. "No, *querida*, luck was with us—luck and Justis Hart."

She wrinkled her pretty nose.

"Old Stony? That is very funny, no? He is so very jealous of you—yet now he helps to save you."

"Never mind about him," said Knight. "What's this I hear about your fooling with G-2 work again?"

"Me? But I am not fooling," said Benita. "I mean the business. I think we make a good team, Doyle, and you, and me, no?"

"No," said Knight. "I told you—"

"You can tell me while we go to the new offices," said Benita. "But it will not do any good—so you had better not be cross."

"What's that you said about new offices?" Knight queried as he and Doyle followed her and the general into the car.

"The Defense Board has a new setup," General Brett interposed. "You've been away, or you'd have been assigned an office there. With all the war fever in Europe, and spy-systems being uncovered here, we thought it best to guard the secret data which is being gathered by the coordinating staff. As you know, there are four members on the Board besides Hart—one each from War, Navy, and Commerce, also a representative of certain key industries."

"I remember they were being appointed last Summer," nodded Knight.

"Well, since then they have had access to every vital secret in Washington—as well as certain industrial secrets which would affect production of war materials. That includes battle plans of the Fleet, in case of war on either coast, or both; mobilization figures; plans for guarding power-plants, communications, and transports; and every important invention for war, including all the latest things in aviation."

"You can understand that all that information can't be left in the ordinary Government office, even in vaults. The average guard system isn't prepared against a really clever attempt such as spies might make. So we've moved the whole outfit underground. As you probably remember, there are various bu-

reaus scattered all over Washington, in former department stores, office buildings, and so on. We've planted a few 'interdepartmental' offices in a downtown section, with secret entrances to basements which are supposed to be filled up with masses of archives, filing-cases of old records, and the like.

"Anyone coming in through the regular basement entrances will find his way blocked by the rows of filing-cases. Back of them we've built walls of reinforced concrete, creating sound-proof underground offices which so far nobody but a few of us knows anything about. They're linked with special direct wires to department heads, and armed guards patrol the entrance passages and secret exits. It's quite a place."

"Sounds like it," commented Knight. "But just what do you expect to do there tonight?"

"We were going to explain the situation to you—but you know most of it already. I want you to tell the rest of the Board about this mysterious blue cloud, and then we'll have to map some scheme for getting at the solution."

"A blue cloud?" Benita said quickly. "Ricardo, what does he mean?"

Knight told her. And by the time he had finished, the car was drawing into an alley-court between two old stores near Fourteenth Street. Brett unlocked a rear door and led the way up a dingy stairway to an office on the third floor. It was at an inconspicuous spot, but Knight noticed that it took two keys to unlock the door. When they were inside, the general barred the door again and led the way to what appeared to be a small supply closet. Pressing a hinged panel at the back, he revealed the entrance to a small automatic elevator.

"This was a private lift used by the store executives," he explained. He reached out his hand toward the button,



but the indicator hand began to move before he could press it. The lighted car slid up into position, its glow shining through the frosty glass paneling.

GENERAL BRETT stepped back as the door clicked open. The man inside was swarthy-faced, with black eyes almost hidden by a slouch hat pulled down low. He gave a barely perceptible start when he saw Brett.

"Evening, General," he mumbled, pushing on by. Then his eyes fell on Knight. The secret agent jumped back, and a look of consternation came into the swarthy man's face. His right hand flicked inside of his coat. Knight snatched a .38 from under his left armpit, and the crashing roar of two shots filled the room.

A smoking pistol dropped from the

swarthy man's hand, and a dazed, unbelieving look came into his eyes. He took a staggering step, clawing at the empty air, and pitched forward in a heap. Knight lifted his arm, stared at a bullet-hole in his left sleeve.

"Deek—are you hurt?" Benita cried.

He shook his head, started to holster his gun, then wheeled as some one pounded on the office door. Doyle by now had his gun out, and he covered the entry as Brett unlocked the door. Justis Hart sprang into the room, jerked to a halt as he saw the crumpled figure on the floor.

"What happened?" he rasped.

"This man was in the lift he tried to shoot his way out of the room," Brett replied grimly.

"I heard the shots," Hart said, staring at the dead man. "I thought the guards had caught some one trying to break in. Who is he?"

"I don't know," said the general.

"I think I can answer that," said Knight. He rolled the body so that it lay face up. "He went after his gun when he saw I'd recognized him. Take a good look, Doyle—you've seen him before."

"The spy at Hong Kong!" exclaimed Doyle. "Holy Jupiter! Then that means—"

Knight was rolling back the dead man's sleeves. Doyle broke off, and the others gazed down tensely at the curious symbol tattooed high on the right forearm. Four tiny faces had been placed so that they completely encircled the arm. All four were identical, even to their expressions of brooding menace. A row of colored dots, unevenly spaced, was tattooed under two of the grim little faces.

Benita's dark eyes went wide with fright as she saw the symbol. She caught at Knight's arm as he stood up.

"I am afraid!" she whispered. "Those awful men they must be after you again!"

Hart looked blankly from the tattooing to Doyle and General Brett, who were exchanging silent glances.

"I don't understand this," he said harshly. "Just what's all the mystery about?"

"Have you ever heard of the Four Faces?" said Knight.

"Certainly," snapped Hart. "They refer to the Hindu god, Siva, which had four faces and—"

"I'm talking about the twentieth century," Knight said curtly. "The Four Faces is the name of a gigantic criminal organization headed by four men whose identity we've never been definitely able to learn, though I have a strong suspicion that at least two of them are supposedly-dead munitions kings—men who conveniently 'died.' They have members in almost every part of the globe. Some of them are reluctant members—the Four Faces have a way of finding out secrets and blackmailing men and women into doing what they command. It reaches from the gutter into the top ranks of society—and at least twice they've almost started another world war."

"Ridiculous!" scoffed Hart. "If such an organization existed, police of a

dozen countries would be stamping it out in no time."

"Then perhaps you can suggest," Knight said coolly, "how this man was able to obtain enough information to penetrate your carefully guarded secret offices?"

CHAPTER III

CLUE ON THE CORPSE

"HE couldn't have passed the guards below," retorted Hart. "He probably found that out and was sneaking away. However, I'll admit it's disturbing to find he was able to get this far."

"Disturbing is a mild word," Brett said gruffly. "And I can tell you, Mr. Hart, that Knight has not exaggerated about the Four Faces. They're a dangerous organization. We've a strong suspicion that they're especially interested in munitions, operating through dummy corporations controlled by some of their members, not only here but in other countries. They'd make a fabulous fortune if war came, and they have other schemes besides making wars."

"We're wasting time here," said Knight. "Doyle, help me carry the body into the elevator. We can search him below, but right now we'd better see if he got past any of the guards."

"You'd better call the coroner first," said Hart. "When you move that corpse, you're breaking the law."

"When you're fighting the Four Faces," Knight retorted, "you sometimes have to forget about the law."

They piled the limp body in one corner of the elevator, and Hart crowded into the confined space with General Brett and Benita. When they reached the basement level, the door slid open and revealed a passage about twenty feet long. It ended in front of a steel-plate door, and the area was brightly lighted. Hart looked around and his granitelike face grew savage.

"There's supposed to be a guard here! I'll have that man court-martialed!"

He jabbed furiously at a button beside the steel door, and in a moment a square panel slid aside, disclosing a section of bullet-proof glass. A blocky face gazed out, then bolts clicked and the door opened.

"Sergeant Gray!" rasped Hart. "Where's the outside guard?"

Gray stared out into the entry-space. "He was here ten minutes ago, sir. He must've gone up for something."

"Help us carry this corpse inside," General Brett interrupted. "You can search for the guard later."

The sergeant took a stupefied look at the dead man, but Brett cut short his questions and in another moment the body was deposited on the floor of the inner passage. Two other guards appeared and gaped at the corpse while Knight made a swift search, making a neat row of the objects he found.

"Anything important?" said Brett, as he returned from initiating a search of the other secret entrances.

"This photograph, and the code message clipped to it," replied the secret agent. "If I'm not mistaken, the code is

in Esperanto—the adopted language of the Four Faces."

"That man in the picture—some-where I have seen him before," exclaimed Benita.

Knight looked at the photograph. It was the picture of an elderly man with a thin, shrewd face and eyes narrowed behind large horn-rimmed glasses.

"Can you remember where you saw him?" he asked Benita.

"Wait—I am thinking." Benita closed her dark eyes, then suddenly opened them again. "Why, it was upstairs—in the hall near Entrance Three. I saw him there only a few days ago. And I remember because I had to wait until he was gone before I could use that door."

"If he had business with anyone in the building, then we can identify him in an hour," said Brett. "I'll have the personnel officer phone everyone who works upstairs in the building to get down to their offices for emergency night duty. We'll show them the pictures."

"And some one might also identify this fellow," Knight added, pointing to the dead man. "Meantime, I'll try to decipher this code if you'll let me have a desk and some paper."

"You can use my office," offered General Brett. "Doyle, you and Benita had better wait in there, too."

He led them through the passage and into a large chamber where a number of maps and charts lined the walls, indicating mobilization plans, the assignment of various factories to wartime work, fleet positions in event of war, and a special map showing emergency defenses at the Panama Canal. A vault-door stood open with an armed guard at the entrance. And two officers in civilian clothes were bringing out a number of blueprints stapled together. Knight whistled as he saw the various maps.

"What wouldn't certain foreign governments give for a look at those!"

"And the stuff in that vault," Brett said. "Every vital defense secret of the United States is in this room. Sometimes I shiver to think of it. Maybe it should have been located at an Army base."

He opened a door near the entrance to the map-chamber, and motioned the three of them into his office.

"Go ahead on that code, Dick. I'll be back as soon as I get the wheels rolling."

As the door closed, Knight turned quickly to Benita.

"Tell me, *querida*, can you remember anything else about the man you saw?"

"Si, I know that he seemed very nervous. He was carrying a bundle, and he was looking at the numbers of the offices on the second floor."

"At least, that narrows it down. Well, I'd better tackle this code."

TEN MINUTES passed, while Knight worked on the cipher and Benita and Doyle talked in low tones. Suddenly a shrill, eerie whistle sounded from out in the map-chamber, rising and falling with an odd, blood-curdling cadence. Knight sprang to the door, gun in hand.

As he jerked it open every light in the place went out, leaving the rooms in inky darkness.

Above the clamor of panicky voices came the sharp report of a gun, then a finger of light stabbed out from one wall, where an Air Court chart had been secured. The shifting glare fell on Hart and General Brett and two or three frightened officials nearby. Back of the light, a gun roared again, and one of the officials slumped to the floor. Before Knight could determine where to aim, another beam shot out from the wall and spotted him along with several guards.

"Look out, Knight!" shouted a voice. "You're blocking our fire!"

Knight sprang aside before he realized that the shout came from back of the light. Instantly a Tommy-gun clattered, and two of the guards fell.

"Knight — you damned traitor!" screamed Hart.

Half-stunned, Knight stared at him and the general. Hart's face was livid with rage, and in General Brett's eyes was a dazed, incredulous look that cut Knight to the heart.

"General!" he cried. But the shriek of a dying guard drowned the word. Forgetting his lifted gun, he ran toward Brett. Hart leaped in front of the G-2 chief, made a furious grab at Knight's automatic. The secret agent stiff-armed Hart with a jolt that sent him plunging to the floor.

"Gas!" bawled a hoarse voice. Knight whirled, and an icy dread ran through him. A faint, bluish smoke was seeping through a crack in one wall, eddying in the glare of the flashlights.

Above the din of stampeding men, he heard Benita scream. Abandoning the attempt to reach Brett and clear himself, he fought his way back to the door and saw Doyle trying to drive an opening through the terrified group, with Benita close behind him. A clerk, maddened by fear, leaped into the gap Doyle had made.

Knight hurled the man back, seized Benita, and started to battle his way through. The blue smoke began to spread, and in a flash he saw they could not make it that way. He lifted her in his arms, ran desperately back toward the steel door.

"Deek! Save Uncle John!" she cried as he put her down. "I know how to unfasten this door."

"Good girl!" he said swiftly. Then, as she slid back the first steel bolt, he dashed toward the center of the map-chamber. But a sudden explosion threw him to the floor.

By the time he regained his feet, a wall of flame had cut him off from reaching Brett. Through the blaze he dimly saw men in queer-looking helmets tearing down the master charts and maps, seizing blueprints and plans from the opened vault. He took quick aim, dropped one of the raiders. But a billow of flame cut off his view before he could fire again. He raced to one side, glimpsed an opening in the wall where the Air Corps chart had been. Two helmeted figures lunged into the tunnel with maps under their arms.

The bluish smoke had disappeared,

but a cloud of tear-gas abruptly spread out into the chamber from the fissure where the other had first appeared. Gaggling, tears streaming down his face, Knight was forced to retreat to the exit. The steel door was open, but Benita was nowhere in sight.

He ran to the lift-door, saw that the cage was up. A jab at the button failed to bring it down, and the spreading tear-gas drove him farther back into the basement. He found himself in a *cul-de-sac* formed by a reinforced concrete wall, the only exit being an old coal-chute secured by three heavy bars. Hammering with the butt of his gun, he managed to slide them free, and with the gas sweeping after him he climbed into the chute. The man-hole cover at the top proved no obstacle, and in another moment he was scrambling out into the alley.

The first person he saw was Sergeant Gray. The sergeant's face was bruised, and his coat was torn half off. He lunged at Knight, then jerked to a halt as he saw the secret agent's raised gun.

"Where's the girl who was with me?" Knight grated.

"She was hurt," stuttered Gray. "Somebody took her to an ambulance."

Knight shoved him aside, ran toward the street. Sirens were blasting fiercely, and as he reached the sidewalk he saw police cars and fire-trucks arriving on the scene. But there was no sign of an ambulance. He dashed back into the alley, turned into another which crossed at right angles and saw two of the oddly helmeted men spring into a waiting ambulance, each carrying rolled up maps and charts. The machine roared past Knight, almost running him down. He fired at the rear tires, but missed, and with a desperate speed he charged into the street and toward the nearest police scout-car.

"There he is!" howled an infuriated voice. He spun around and saw Hart, a disheveled figure, beside General Brett and Doyle. Doyle was holding up the general, who seemed on the point of collapse. The police, who had left the scout car, wheeled at Hart's shout.

"Arrest him!" bawled the defense expert. "Grab him, you fools—he's trying to get away!"

KNIGHT was within ten feet of the scout-car. Seeing the ambulance about to turn the far corner, he turned and leaped into the driver's seat. A police revolver barked, and a bullet drilled the windshield. He swiftly meshed the gears, bent low as the car surged ahead. A volley of shots followed him, and crashing glass fell from riddled windows. The crowd filed to both sides, and he took the turn on two wheels.

The ambulance was a block ahead of him, speeding down Fifteenth Street. He shoved the throttle to the floor, was rapidly gaining when a dark sedan cut across his path. As he violently swerved to avoid hitting it, he saw that the man beside the driver was hastily taking off a helmet like the ones the raiders had worn. With a wild swoop to the opposite curb, he grazed an oncoming car, then shot around a safety-zone and left

the sedan behind. Though he knew it contained men who knew the secret of that mysterious attack in the defense offices, there was no time to investigate now. The stolen secrets were in the ambulance, and Benita was in the hands of the Four Faces agents.

Knight's face was flinty-hard as he weaved in and out of traffic, the police siren clearing his way. Unless he saved Benita now, the chances of seeing her alive again were almost zero. Twice she had been involved in his unending fight against the four masked fiends who headed the criminal empire, and he knew she, like himself, had been marked for their vengeance.

The ambulance passed the Treasury, but did not turn toward the Ellipse, as he had expected. Instead, it raced



straight on down Fifteenth, across Constitution Avenue and into the winding road near the Monument. Taking curves at terrific speed, it sped on around the edge of the park, and into the approach highway Bridge. But at the junction with the road past the Washington Tourist Camp, the fleeing machine made another wild turn and headed toward the speedway road that bordered the river. Knight, hastening to catch up before the car reached the bridge, was unable to make the turn. By the time he had slowed down enough to reverse direction, the ambulance was almost to the Potomac.

Wide open, the scout-car tore after it. Knight saw several figures emerge from the ambulance as it slid to a stop alongside the embankment wall. Then a light flashed up from a waiting speed boat, and a machine-gun blasted at the police car.

Knight skidded off the road, jumped from the car. But the boat hastily chugged away after that one quick burst, and when he reached the ambulance he found it was empty. In consternation, he made out the shape of a Sikorsky 34 in midstream. Its four motors were already being started, and he realized that in another minute or two the transfer would be made.

THEN a shriek of sirens from behind woke him to a new peril. Police were on his trail, following perhaps at Brett's order. Frantically, he ran back to the scout-car and drove it into the tourist-camp entrance, waiting until a squad-car and two police motorcycles had streaked past. With lights off, he raced for a block, then snapped the switch and headed at top speed for Water Street. By the short route around the Southwest section, past the Navy Yard, he might reach Anacostia in time to block the Four Faces' scheme. Siren howling, he drove at a mad pace, praying that the dragnet for him would not have time to extend to the Naval Air Station before he could arrive there.

A startled sentry whipped open the

barricade as he hurriedly displayed his special Navy credentials, and he drove on through to the administration building. As the O.D. came out, Knight gave a sigh of relief. This was an officer he knew.

"Hunter! No time to explain—hell's broken loose, and I need a ship, pronto!"

"What kind?" exclaimed Hunter.

"An amphibian, if you've got one—or else a seaplane."

"We've got some Severskys—I'll have one out in two minutes," Hunter said breathlessly.

"Okay. Every second counts." Knight nervously dragged at a cigarette while the O.D. had a crew rustled out of their quarters. There was no time to have guns put on the ship. The best he could do was to try to follow the Sikorsky, unless he could crash its wing and cripple it before it got off. Straining his eyes, he thought he could see it taxiing out. After a minute, the sudden flash of winglights confirmed it, as the big plane prepared to take off. He strode to the side of the Seversky as the motor kicked over.

"No time to warm her up!" he told the senior mechanic. "I'll take her now."

He was climbing into the cockpit, when a messenger came running along the ramp. Hunter spotted a slip of paper with his flashlight, turned and dashed toward the amphibian. Knight swore, rammed open the throttle and sent the ship rolling down the ramp into the water. A pistol jetted flame behind him, and he knew that his guess had been right. The word had been flashed. He was a marked man!

CHAPTER IV

THE FOUR FACES

ANOTHER SHOT sounded faintly through the din of the motor. Knight ruddered to turn the slipstream toward the group on shore, and a flurry of water swiftly blinded the man with the gun. Knight pulled the hatch enclosure and latched it.

The Sikorsky was now on the step, passing Hains Point. Hastily retracting the wheels, Knight sent his stolen amphibian racing to cross the larger ship's path. If he could hit the wing with his prop, the Four Faces crew would be helpless, and Hunter would be sure to rush armed Navy men out to the scene.

The two planes were a hundred yards apart, both almost at take-off speed, when a Tommy-gun suddenly blazed from the portside of the Sikorsky. Knight crouched lower, hurling the smaller ship straight at the fugitive craft. A hail of bullets pounded into the Seversky's wings, and the Plexiglas above him was drilled in a dozen places. Even so, for one heart-pounding instant he thought his mad plan would succeed. But then the Sikorsky lurched free of the water and zoomed.

He jerked the stick back, still hoping to catch it at the last second, but he missed the tail by six feet. Both ships dropped back onto the water from their too-sudden climbs. Knight took off

quickly and swooped back toward the big transport. But it was now fully fifty feet in the air, and with a groan he had to give up his scheme.

To crash the Sikorsky now would be to imperil Benita's life, and even though the fleeing men held vital secrets in their grasp, he could not force himself to finish such a desperate plan.

The Tommy-gun blazed again as he hanked to follow the fleeing flying boat. He pulled up steeply, intent on keeping out of range and at the same time holding the transport in view.

The altimeter showed 2,000 feet, when a searchlight from the Naval Air Station flickered across the Potomac and lifted into the sky. The beam probed around madly for a moment and then caught the wings of the Seversky. Knight skidded out of the glare, but another light caught him and for fully a minute he dodged the swordlike beams, unable to see a thing above or below.

When at last he shook off the lights, he could see nothing of the Sikorsky. Below, floodlights revealed planes hurriedly being shoved out from Navy hangars. Knight looked down helplessly at them. Even if he could have explained the true situation, there was not time enough for the pilots to warm their engines and spot the Sikorsky so that it could be forced down.

He climbed at a sharp angle, manifold pressure at the danger mark. There were two parachute flares in the release slots, but it was senseless to use them now. His only chance was to catch the Sikorsky on the water, or at some ground base—and then cripple it until he could flash word by radio for Service pilots to race to the spot.

That meant gambling on the only clue he had—the vague idea which had been growing on him since the destruction of the O-47's. Grimly, he set his course for Chesapeake Bay, heading for the area, just north of the mouth of the Potomac, where Doyle and he had seen the Army men die. He would search out the base of the falcons of the fiendish Four!

The Seversky flew into light snow, on into freezing clouds. Ice began to form on the wings, but the brute power of the motor kept him climbing. Twenty minutes later he broke through into a clear, cold starry sky. By dead reckoning, he was within a few miles of the location where the afternoon's mysterious events had occurred. The propeller was in high pitch, but now he changed it to low and set the throttle at half speed. Turning on his landing-lights, he began a series of quick turns, zooms and short dives, ceaselessly changing direction.

Five minutes dragged by, minutes that seemed an age. The air was icy-cold, but perspiration was running down Knight's forehead as the sixth minute began. If he were wrong, then everything was lost. If he were right, he might not live to—

WITHOUT the slightest warning, a bright bluish cloud appeared to the right. But for the tight bank he had begun, he would have plunged straight into its swiftly expanding depths. Pulses

pounding, he whirled the Seversky into a grinding reversal. A second blue cloud sprang into his path, but a hundred feet below him. He rolled hastily, closed the throttle and dived away from the deadly blue clouds. A moment later, easing out of the dive, he cut the switch and his lights and started down in an irregular spiral, closing the shutters to keep the motor warm.

Down . . . down . . . down the amphibian moaned, while he held his breath and watched the altimeter. He might still be wrong—there might be some way they could pick up the whisper of his wings, instead of depending on the roar of the motor. It might be some other sensitive device which they were using, instead of the one he had seen demonstrated at a secret Air Corps-Artillery test.

A dozen times, he came out of the spiral, glided right or left, changing direction, but always holding to a central course that would keep him under the place where the blue clouds had appeared. Then, at 5,000 feet, the freezing clouds thinned out, and off to his right he saw a few tiny lights marking the shoreline of Chesapeake Bay.

Then his fingers went tense on the stick as he saw another light below and near the center of the bay. It was a small floodlight, and in the reflection from the water he could make out the shape of a dark-painted yacht from which it had been switched on. He waited, gliding as slowly as he dared, and in a moment he saw the Sikorsky taxiing in to a boom which had been rigged out.

Knight's cold fingers shot to the radio switch, then he stopped. If he flashed word to Washington now, those devils below would have time to escape. Benita would undoubtedly be killed and the stolen secrets would be gone forever. Tight-lipped, he banked away. Another twenty minutes would put him back at Anacostia. They would arrest him, but they would have to listen. Brett would surely believe his story. The yacht and



the Sikorsky could be captured by a concerted action of air and destroyer forces from Norfolk.

There was one danger. If the devils below heard his motor when he switched it on, they might take alarm. But he could stretch his glide at least ten miles more . . .

An oath ripped from his lips as the darkness above him was split by a dazzling glow. His hand leaped to the switch, and he dived to start the motor. The moan of the Seversky's wings rose to a howl, but still the motor did not start. He was down to a thousand feet when it caught and revved up with a booming thunder.

Under the flare which had been dropped, another Seversky came plunging at furious speed. Knight whipped into a vertical turn, trying to escape in-

to the darkness. But the pilot of the other ship cut him off with a tracer blast past his wings. With another lightning turn, the secret agent raced toward the yacht. The tracers from behind him quickly ceased to flash by, but a machine gun on the vessel at once took up the fire. Knight kicked out of the fusillade, cursing his lack of guns.

A crew of men was crouched around a triple AA-gun mounted in pom-pom fashion amidships. A false deck-house had been swung open to permit aiming it, but the gunner was holding his fire, unable to set his fuses for such a low altitude. Knight seized his radio switch, but another burst from the yacht's machine-gun drove him into a series of splits and turns, with no chance to flash a warning back to the capital.

The parachute flare was down to 2,000 feet, and with a sudden hope Knight backsticked to get above it. The other Seversky charged after him, guns pounding, and a diagonal line of bullet-holes magically appeared in the left wing. With a quick inspiration, he jerked one flare release, to send the blinding torch into the other man's path. The added glare in the sky told him the flare had lit up. But in the same moment a final burst hammered across his cowl and his engine abruptly went dead.

As he nosed down, Knight thought he saw another plane higher and off in the shadows beyond the zone of light. It looked like a Douglas torpedo-plane, but he had no chance to make sure, for the other Seversky was on him in an instant, herding his crippled ship down toward the yacht. Knight threw a look over his shoulder, saw that the amphibian was a duplicate of his own, even to the Navy insignia. The pilot ruddered in closer, his face hidden by a huge oxygen mask, of the type which had been worn by the mysterious pilot who had flown the unmarked Seversky.

Fuming at his helplessness, Knight brought his ship down alongside the yacht, leveled off for a stall landing. As the plane stopped moving, some of his rage left him. If ever he needed a cool head, it was now. Pretending to have been hit, he sagged over the controls and quickly raised the radio-mike to his lips. Then he switched on the transmitter, hastily set the wavelength.

"Q to General Brett!" he said tensely. "Q to WAR—to Naval Air—whoever is listening, take a bearing, send help to—"

There was a sputtering roar, and a boat thudded alongside the Seversky. Two armed men clambered onto the pontoons. The first man swung onto the wing, and as he saw Knight with the mike in his hand he leaped toward the cockpit with an oath.

"Drop that!" he snarled, and the glare in his eyes told Knight that he would fire instantly if he were not obeyed. Despairingly, he let the mike fall and stood up. At gun-point, he was hustled down into the boat, which at once put off for the yacht. The other Seversky had also landed and was taxiing in to a boom on the starboard side. The

boat churned in at the bottom of the gangway, and Knight glumly climbed the ladder.

JUST as he reached the deck, the pilot of the other plane appeared. A group, evidently from the Sikorsky, started toward this flyer, but he waved them aside and stalked over to Knight. "So I've finally got you, Mr. Knight!" he rasped.

Dumbfounded, the secret agent stared at the figure before him. With a quick motion, the pilot removed his gargoyle-like mask.

"Hart!" Knight gasped. "You—a traitor!"

"Yes, me!" mocked the other man. "Hart, the Puritan—honest 'Old Stony'! I fooled you all! I've been waiting months for this moment—and now I've got you."

A bearded Sikh appeared from a companionway and muttered something to Hart. The traitor scowled.

"I'll be there to report in a moment." He turned to the group from the Sikorsky. "Where are the maps and the rest of the information?"

"They are already below, *sahib*," interrupted the Sikh. "And I was told to inform you that *They* desire you to report at once."

"Very well," snapped Hart. He beckoned to two staring gunners. "Bring the prisoner below, and if he makes a crooked move, brain him!"

Knight's eyes swept the group on deck. "What have you done with Benita?" he demanded of Hart.

The traitor looked at him blankly, then burst into a roar of laughter.

"So that's why you chased down here! Galahad off to save his lady—why, you poor fool, she got away from us back in that alley!"

Knight's relief showed in his face, and Hart's mirth changed to a quick anger.

"But don't worry, she won't be free very long. Get down that ladder!"

He gave Knight a push which sent him headlong. Dazed, the secret agent picked himself up at the bottom. The two guards gripped his arms and propelled him through a passageway and into an expensively decorated cabin where two more Sikhs stood before a heavy mahogany door. At Hart's command, one of the Sikhs went inside, returning almost at once.

"*They* will see you, with the prisoner," he salaamed.

A silence fell, and Knight saw the awed expressions on the faces of his guards as he was taken into the adjoining cabin. Reddish light flooded the first part of the room, directed so that it fell on anyone entering, at the same time keeping the rear of the room in shadow. Knight halted with the others, his feet making no sound on the thick rug which covered the deck.

For a moment there was a hush broken only by the heavy breathing of the guard on his left. Then his eyes became accustomed to the ruby-colored light and he saw into the shadows.

A long table stood a few feet out from the bulkhead, and seated before it were four black-robed figures, their faces

identical in their expressions of grim, brooding menace. With an icy chill running up his spine, Knight realized that once again he stood before the Four Faces!

Though he knew the horrible faces were masks, worn to disguise the identity of the fiends who guided the invisible criminal empire, a hollow feeling came into the pit of his stomach as he looked upon them. For the faces were alive, made so by the dreadful intensity of the eyes back of the masks. He waited, perspiration dripping down his face, for the silence to be broken. At last the robed figure on the left leaned forward, and with a shiver Knight heard the deadly, toneless voice he had come to know as that of the First Face.

"Number Seventeen—your report!"

HART had lost his blustering manner, but his voice had a dogged note as he answered: "The plan was carried out according to order, except for changes made necessary by the unexpected arrival of Knight and Doyle."

The First Face made an imperative motion with his hand.

"You are aware of our routine! We require a full report since your departure this afternoon."

"Very well," said Hart, sullenly. "After taking off, to watch the high-altitude test against the O-47's, I encountered an A-18 later found to be occupied by Knight and his co-agent, Doyle. Not expecting to find another armed plane, I was forced to break off the fight. I covered my retreat by spraying a cloud of Tetral's gas from the tail of the Seversky."

"What of the tests?" interrupted the Fourth Face.

"The first shell you fired burst squarely in front of two O-47's," replied Hart. "The other O-47 was saved because it had just turned back when the A-18 appeared. I flashed you a radio signal not to fire any more shells because I was too close to the other ships."

"Proceed," said the First Face, curtly.

"I landed at Base Two and changed to the A-18 I had been using on a 'defense tour.' There I learned that McGowan had escaped a few minutes before, using the P-26 which was forced down after we destroyed the others with Tetral shells. I raced back to Washington to intercept McGowan—and also Knight, if possible."

"We already know what occurred there," said the First Face. "Number Eighty-two reported in code, also warning us to remove the agent at Raleigh before he was arrested."

"Knight must have forgotten about that," said Hart. "He ran into Schlader—Number Two-Fifteen—at the entrance to the secret offices. I was trying to get there first, but I was held up in traffic. Knight recognized Schlader and killed him, then pointed out to Brett that the Four Faces were involved. He also found a picture of Tetral which Schlader had forgotten to destroy the day we told him to seize Tetral when he came there. I knew they would identify it within a few hours,

And if they found out about how Tetral had invented a new gas and had come to the defense board, it would ruin everything. No one else on the board knew about it except myself, so—"

"The implications are obvious," cut in the First Face. "That is why, then, you ordered the action three hours earlier than planned?"

"Exactly," said Hart. "The men were in the tunnel we'd made behind the chart, and all the cars were at their stations. But I made one change—I framed it to make Knight the goat. They all think he's the one that worked the scheme. That means I can go back and keep on, if necessary."

"No one suspects you, then?" demanded the Third Face.

"Not a soul," Hart said triumphantly. "I've been years building up the reputation I've got. I knew if I waited long enough my chance would come—"

"We are not interested in your ambitions," said the Second Face coldly. "You will remember that you are still a probate member, in spite of the important duties entrusted to you. Also, it will be well to recall the information we hold concerning your dealings in China—in case you have forgotten that we have it."

Hart's face darkened, but he kept silent.

"Why were General Brett and his ward allowed to escape?" continued the First Face.

"It was necessary to leave Brett there," Hart said sourly. "He was the only important officer who could testify to Knight's appearing to have turned traitor. If the attack had come later, as planned, the entire board would have been there and we could have captured Brett. As for his ward, she was caught. But somehow she managed to get away from Sergeant Gray. I would have had time to help, but I had to retrieve a code which Knight found on Schlader's body. I wasn't sure it would be burned—there was an error and Tetral gas was released for a moment at the start, instead of tear-gas. Some of the men became panicky and ran before setting off the full number of incendiary bombs about the place."

"Is that your full report?" said the First Face, with an odd intonation.

"All, except that I planted a story about a P-26 having been sighted at sea, the day we destroyed the flight of Army pursuits—and that I should be given credit for killing McGowan. He would have downed Knight's ship, thinking it was mine, if I hadn't charged in. Then he would have landed and told the whole scheme."

"You were saving your own life in killing McGowan," retorted the First Face. "And now, you will explain what you did with the money which was to be paid to Tetral?"

Hart gave a start, but quickly recovered himself.

"I paid it to him, as agreed."

"That is a lie," said the robed man icily. "You kept it, risking the success of our greatest plan—and then had him killed on the pretext that he was demanding more money and had threatened to betray us."

CHAPTER V

THE MASTER KEY

A TENSE SILENCE fell, and Knight felt a faint surge of hope. If this argument developed far enough, it might give him a chance for a break. He watched Hart from the corner of his eye.

"All right," the traitor said harshly, anger replacing his awe, "I took it. But you took that much from me out in China when you forced me to join this damned outfit!"

At this, the First Face lunged to his feet. But a sudden sharp rap at the outer door interrupted him. One of the Sikhs entered, behind him one of the yacht's officers.

"What is it?" demanded the First Face.

"We have captured two more prisoners," said the newcomer hastily. "I identified the man from our picture file as Doyle, Knight's assistant. There is a girl with him."

"La Navarre!" exclaimed the Fourth Face. "Where were they? And how did you capture them?"

Knight listened with a sinking heart as the officer explained.

"They were flying a Douglas torpedo-plane—unarmed. The plane landed with its motor shut off, but I thought I heard something and I picked it up with the spotlight. I sent a boat crew to bring them on board. Doyle resisted, and one of our men was killed before he could be subdued."

The First Face whirled to Hart. "There is evidence of bungling here! How could they have followed unless—"

"Doyle must have guessed, the same as Knight," interrupted Hart. "I'd say that they simply remembered about the blue clouds this afternoon and knew the answer lay somewhere around here. Doyle hadn't reached Anacostia when I took off pretending to pursue Knight. So he couldn't have followed me. And the Sikorsky was already gone."

"There is something else," broke in the ship's officer. "The radioman on watch reports that Knight flashed a brief message just before he was caught. Station WAR and the operators at Langley and Norfolk have been talking in a new code ever since."

"It might be a trick to keep us here," rasped the Third Face. "Even now, naval vessels may be on the way here."

"Impossible!" cried Hart. But the First Face silenced him with a peremptory gesture.

"We'll take no chances." He stabbed a long finger at the ship's officer. "Have the Sikorsky bomb-racks filled with Tetral units, and prepare to get the yacht underway as soon as the plane can take off. If they send any vessels from Norfolk, the Sikorsky can take care of them and we will soon be safely at sea. And as soon as you have given the order, send in the prisoners."

The officer saluted and dashed out. The First Face turned his slitted eyes on Knight.

"And now, Mr. Knight, there is a little matter concerning you."

"You're wasting your time," Knight

said dully. "I told you twice before I'd never join the Four Faces."

"We have no intention of giving you that chance," said the First Face, sardonically. "But we will give you the chance to see the *señorita* Navarre die a quick and merciful death—instead of the prolonged agony now marked out for her."

Knight's face whitened. If he could bargain with these devils without betraying his country, then that one last horror could be averted.

"What do you want?" he said hoarsely.

"How much have you learned about this present operation of ours?" said the First Face. Knight saw the other robed figures lean forward to hear his answer.

"I know you've stolen the new Army robot-director device developed for A-A guns, the one that aims automatically



when it picks up the sound of a plane. And you've stolen a battery of the new guns that are effective at 30,000 feet. You're using this stuff you call Tetral in the shells. And you're probably going to sell those stolen plans to some European country to keep your damned cut-throat empire going."

"Almost, but not quite, correct," said the First Face silkily. Then his voice hardened. "So that you will be able to visualize your fiancée's fate, if you refuse to save her, I will tell you something about Tetral, Mr. Knight. You saw the effect in the air, I am told. When sucked into the cylinders of an engine, it causes a terrific explosion unless the ignition is cut off at once. It is as powerful as any known acid, and anyone sprayed with even a diluted solution dies as though slowly burned to death. We can dilute a solution until it will take half an hour for a person to die. Thirty minutes of more frightful torture than the bloodiest Oriental ever conceived. If you refuse what we ask, you will stand and see *Señorita* Navarre die by—"

One of the Sikhs appeared at the door, and the First Face broke off to give an order. "Keep the prisoners outside a minute." He motioned to the ones who guarded Knight. "Bring him back into this corner and dim the lights so he will not be seen. Gag him, also."

A NEW FEAR went through Knight as he heard the faint note of amusement in the voice of the robed spokesman. It was plain that the First Face had some trick in mind. The Sikhs dragged him into the corner beside the end of the long table, and in a few moments Benita and Doyle were brought into the suddenly darker room.

In the deep red glow, Benita's face had a ghastly color. But her head was high in spite of the terror her eyes held as they rested on the four robed

figures. Doyle was dripping wet, and a bruise under one eye was rapidly turning black and blue. Both had their hands tied behind them. Hart had stepped back of the door as it opened, and he stayed there, out of sight of the two prisoners.

The First Face looked menacingly at Doyle. "What made you come to this area?" he demanded.

"Wouldn't you like to know?" snarled Doyle defiantly.

The eyes back of the mask shifted to Benita. "Perhaps the *señorita* can tell us?" the robed man said suavely. As Benita made no answer, he spoke in a low tone to the Sikh door-guard. The man disappeared, returned with a brass cylinder about sixteen inches long and three inches in diameter. It was capped with a lock-and-spring device, a wing-nut holding the release from being accidentally sprung until it was safely in position in a shell or a bomb.

"Mr. Doyle," said the First Face, softly, "you are perhaps curious as to the source of the strange blue clouds which killed the Army airmen today?"

Doyle's eyes fell with sudden horror on the brass cylinder.

"I see you understand," said the robed man, with a dry chuckle. "I wonder if your continued silence is worth the alternative of being shut into our test-chamber with some of this Tetral gas."

Benita sprang forward, her eyes dilated.

"No! No! Do not torture him—I will tell. He came because he thought his friend would be flying this way. Because of the blue clouds this afternoon—"

"Then we have less to fear," the First Face said in an undertone to the other robed man. Knight caught the words. The spokesman turned and nodded to the Sikh guards, and Benita was brought closer to the table.

"There is one other thing, *Señorita*. You have been working with Army intelligence. You will tell us every detail of what you have done for General Brett, including the new system of communication between G-2 agents abroad."

Benita stiffened. "No," she cried. "I will not tell—even if you kill me."

"We shall soon see!" grated the First Face. He jerked his hand, and Knight's guards shoved him out from the dark corner. Benita stumbled back with a moan.

"Ricardo! You, too—a prisoner!"

"He will go into the test-chamber—unless you answer our questions!" snapped the robed man.

Benita's eyes clung to Knight's but he grimly shook his head.

"No—I will not tell!" she whispered.

The First Face swore under his breath, spoke in Hindustani to one of the Sikhs. The man removed Knight's gag.

"One last chance, Mr. Knight!" said the First Face savagely. "If you don't talk, then you go into the chamber together!"

Dry-lipped, Knight slowly nodded. After all, they had all the defense secrets. There was nothing he could tell them which was not contained in the charts or plans.

"What do you want me to tell you?" he said huskily.

"We want the details of the Q-Agent system," said the First Face coldly. "Who are the others? Where are they located? In how many countries do they operate?"

KNIGHT held his breath, trying to hide his amazement. There was only one Q-Agent, and that was himself. His designation as Q-1, Q-2, and other numerals, indicated only the department or bureau with which he was working at the time. He had thought this to be known to the Four Faces. But apparently the trick had continued to deceive them.

"You will give us that information—plus any other items necessary to complete a full knowledge of the defenses of the United States," finished the masked figure.

Benita whirled suddenly to Knight, her eyes blazing. "Tell them nothing, Ricardo! They have no secrets! They did not get the master-key to the map-codes!"

Knight stared down at the table on which the stolen information had been placed. One of the maps had been spread out, and he saw that it was covered with cryptic symbols. There was no key anywhere on the map.

For a moment after Benita's outcry there was a stark silence. The eyes of the Four Faces turned, as one man, on Justis Hart.

"What is the meaning of this?" snarled the First Face.

Hart lunged forward with the fury of a trapped rat.

"I'll tell you what it means! You thought you'd finish me off when I'd done all your dirty work! You'd make a fortune selling all this stuff to one of the foreign powers—and I'd be at the bottom of the bay with my throat cut! I heard you that night—I never told you I understand Hindustani."

"Where is the key?" said the First Face in a terrible voice.

"In my head!" raged Hart. "I threw the book into the flames when I left there tonight. I've spent days and nights memorizing every point, every symbol. I can rebuild those maps from memory and tell you a thousand things that don't show on them. And you'll pay me what I ask—or by Heaven I'll wreck the whole damned scheme!"

CHAPTER VI

TRAITOR'S REVENGE

THE FOUR ROBED MEN were on their feet, and the Sikhs gripped their pistols tensely, eyes rolling from the Four Faces to the man who had defied them.

"You fool!" the First Face said in a voice hoarse with passion. "Death is the only pay you'll get for betraying us!"

Hart's blocky face paled in the red light, but he doggedly shook his head.

"I haven't betrayed you! I've simply saved my own life—while getting all the information you need. Give me my price, and it's yours—after I'm safely off this boat."

"We make the terms here!" snarled the First Face. "I'll give you one chance—"

The roar of a motor being started drowned his words. The next instant the ship's captain plunged into the red-lighted cabin.

"A message from F-13!" he gasped. "A B 17 and a flight of attack ships is on the way here from Bolling Field, and the Navy is sending a squadron of bombers from Norfolk!"

"How do you know they're coming here?" grated the First Face.

"F-13 took off and followed them to get the course. It leads exactly across this spot."

The four robed men conferred hastily in whispers.

"Have the Sikorsky brought alongside the gangway!" ordered the First Face. "We will evacuate the yacht with the prisoners and the defense documents. The extra members of the crew can take to the speed-boats and make contacts at Base Two later."

The yacht captain vanished, and the First Face turned to the nearest Sikh guard.

"Put *Sahib* Hart under arrest!" he barked in a furious voice.

The bearded Hindu started toward Hart. The traitor jumped back, one hand inside his coat, and for a second the eyes of the other guards were on the two men. It was the moment for which Knight had tautly been waiting. With a whirlwind spring, he slammed his fist to the point of the nearest Sikh's jaw and dropped the man to the floor. Before the other guard could fire, he snatched the brass cylinder and leaped back of the First Face. Spinning the wing-nut almost off, he whipped the gas-unit above his head.

"Drop your guns!" he snapped. "If anyone moves, I'll open this cylinder and kill everyone in the room!"

The hands of the First Face stopped scant inches from Knight's throat, and the other robed men shrank back. Hart froze, his automatic half-drawn, and the Sikhs let their guns clatter to the deck, the whites of their eyes showing. Knight jammed the cylinder under his arm, seized the nearest Sikh's gun.

"Into the corner!" he flung at the Four Faces. "Wait—you take off your mask!"

The First Face raised shaking hands and slipped the elastic bands which held the thing to his head. A diabolical yet handsome face was revealed, with hair prematurely silvered, and dark eyes now blazing fiercely with rage.

The American racked his memory, yet could not identify the man. Perhaps the devil had called upon a plastic surgeon to alter his real features.

"You'll pay for this, Knight!" the unmasked man snarled.

"The robe!" Knight ordered. He put it on, sidestepped across the room, keeping his back close to the wall. Hart still held his gun half out of his concealed holster, but his eyes were sick with fear.

"Take your finger off the trigger!" Knight said grimly. "Now drop the gun in Doyle's pocket and untie his hands."

"What are you up to, Dick?" Doyle whispered anxiously.

"We've got to fool those devils out on deck," Knight answered. "I'm going to put on this mask and try to pass for that rat over there in the corner."

"You'll never make it, you swine!" rasped the silver-haired spokesman. "They'll tear you apart."

"Keep quiet," Knight said curtly. Then while Doyle covered the prisoners, he hastily put on the mask, adjusting so that it would not slip easily. "Benita, I've got to leave your hands tied until we get into the plane. Doyle, slip the gun inside your belt, and hold your hands behind you until we're out of danger. If it's dark on deck, it ought to be fairly easy."

Doyle cautiously opened the outer door before hiding the gun. The Sikh door guard was already inside, and the entry-cabin was deserted.

"Watch them while I yank out these wires," Knight rapped. He put down his gun, tore away several call-button and phone wires which ran to instruments in the center of the table. Then, motioning Hart ahead of him, he followed Doyle and Benita.

"No one on deck will know you were ordered arrested," he told the white-faced traitor. "Until we get to the Sikorsky, you're just helping guard the prisoners—understand?"

Hart mumbled something, and Knight slipped the cylinder under his robe, holding the gun with his other hand. "One yip, and I'll let you have it," he warned Hart. As they reached the door he threw a swift glance back at the Four Faces and the Sikhs. "Lie down, every one of you!"

The unmasked First Face was the last to obey. As he dropped beside the three robed men, Knight slammed the door and shot the bolt.

"Take Doyle's left arm," he snapped at Hart. "Make it look as though you're rushing him up the ladder. And remember, this gun may look as though it's covering Doyle—but a quarter of an inch jerk will do you a lot of damage."

THE ROAR of the Sikorsky's engines drowned everything else as they reached deck. To Knight's relief, all but one light had been turned off, and that was a shielded one pointing down the gangway. The ship's captain appeared in the gloom, stared at Knight's masked face.

"Go down with some men and bring up the rest of the defense documents," Knight said in a careful imitation of the First Face's tone. "We were unable to bring all of them."

The officer barked a command and started down with several men hurrying after him. Knight shoved Hart ahead of him, and the other men on deck hurriedly parted at sight of the Four Faces mask. The Sikorsky was at the bottom of the gangway, with a sailor holding the wing with a boat-hook. All four motors were idling. The cockpit lights were on, and Knight saw two men there. No one was in the cabin, indicating that the Four Faces agents were evidently waiting for their leaders to enter first.

Benita had reached the wing and was stepping in toward the hull when a shot barked faintly above the thunder of the

motors. Doyle leaped onto the wing, knocking the lone sailor into the water, then ran in toward the cockpit with his gun lifted. Knight gave Hart a shove ahead, but the traitor sprang to one side and dived headlong into the bay. Dropping the robe, Knight whirled with the brass cylinder drawn back in his hand. At the same moment a pistol blasted from up on deck and a flashlight swerved down the gangway.

"Tetral!" some one screeched, as the light revealed the cylinder. A Sikh at the top of the ladder turned and fled. Knight wheeled and jumped onto the wing, giving it a vigorous push away from the yacht. Doyle's pistol stabbed a red streak through the side of the cockpit as the two pilots leaped to their feet. One of the men fell. Doyle aimed again as the other man jerked out his gun. Knight's shot and Doyle's second one came as one, and the co-pilot tumbled over the body of his partner.

Doyle scrambled into the cockpit and opened the throttles just as a machine-gun began to pound from up on the deck. Knight hurled the cylinder toward the gangway and ran in along the wing. When he reached the hull, he saw that Benita had freed her hands and was running toward him with a Tommy-gun. He took the weapon, fired a burst at the side of the yacht. Then blue smoke shot up from the steps of the gangway, and he realized that he had failed at first to drop off the wing-nut of the Tetral cylinder but that now his bullets had done the work for him.

A dense blue cloud was sweeping up over the side of the vessel. A shadow flashed past the bow, and he saw the Seversky dart away with Hart bent over the cockpit. Moreover, the yacht was starting to move, its screws churning the water as the officers fought to send the deadly gas astern.

The Sikorsky roared across the dark bay, gaining speed rapidly. But suddenly the engines slackened. Knight put down the Tommy-gun, ran to the cockpit. Doyle was hanging desperately to the control-wheel.

"One of those slugs nicked me, Dick!" he said huskily. "Just a jolt in the arm—but I can't handle her—"

Knight caught him, lifted him down into the aisle.

"Take care of him, *querida*," he said hastily to Benita, and he swung into the pilot's seat. The engines roared to take-off speed, and he quickly brought the Sikorsky up onto the step. A dark blur appeared ahead, and he snapped on the landing-lights to brightly outline the Seversky a few feet above the water. As Hart pulled into a sharp climb, Knight reached for the light switches, to keep the big ship from being an easy target. But before he could turn them off, other lights appeared in the sky. Two white tunnels were pointing down from a plane three or four miles away, and with a start he realized it must be the B-17 from Washington.

The men on the yacht were massed forward, to escape the swirling Tetral gas, but as the vessel gained speed several of them ran to the multiple A-A guns. Knight's heart went cold as he saw

their purpose. With the robot-director, they could swiftly get the range of the B-17 and blast one of the deadly blue clouds into its path. And if his guess was right, General Brett would be in that ship!

ENGINES BELLOWING at full speed, Knight zoomed the huge amphibian, swinging back to cross above the yacht. Hart instantly plunged in, guns hammering. From one of the starboard windows of the transport, a bright line of tracers shot toward the diving Seversky. Knight flung a look back into the cabin, saw Doyle on his knees, with the Tommy-gun poked through a broken window. Hart's bullets swerved sideways, tracers marking their path, as he sought to make a quick end of the man behind the gun.

Knight frantically rolled the controls, and the Sikorsky pitched around at the smaller ship, its huge, blunt nose pointed squarely at Hart's pit. The traitor reversed, whirled into a chandelle. Knight banked around toward the yacht, then stiffened. The B-17 was slanting down in a fast power glide, almost blocking his bomb-track across the vessel, and from the darkness at the South came a mighty Consolidated flying-boat, less than 500 feet off the water.

Knight groaned as he saw the Tetral guns swinging down to horizontal. The Four Faces were going to fire their deadly shells point-blank into the Navy ship!

"Benita!" he shouted back into the cabin. "Pull the bomb-toggles when I yell!"

Hart's guns were flaming again, his Seversky having now whipped back at the larger craft. The co-pilot window of the Sikorsky crashed into fragments under a fierce barrage, and the cowl in front of Knight was suddenly dotted with holes. As Hart pulled up for another attack, Knight saw the traitor lift his radio-mike. He snatched the headset beside him, flipped the switch on the set to "receiving."

"Get the Sikorsky!" he heard Hart's frenzied call over the air to the B-17. "The Four Faces are aboard it!"

In answer the huge Flying Fortress zoomed sharply, and its landing lights hurled a bright glare across the Sikorsky's cockpit. In that instant, Knight remembered he still wore the First Face's mask, but it was too late to jerk it off now. The yacht was almost in range.

Half blinded, he leveled off with the yacht directly ahead. Like a madman, Hart charged in again. And battered dural and splintering glass flew in all directions as his guns lashed the cockpit. But by a miracle Knight was not hit. Whirling around in his seat, he shouted to Benita. The Sikorsky gave a faint lurch as the bombs left the racks, and with a fierce zoom he sent it climbing away from the yacht.

Hart's voice suddenly screamed in the earphones—

"They've got the Consolidated! Help me, you fools, or you'll be next!"

Knight stared back in consternation. There were two bluish clouds. One of

them, larger than the other, was sweeping over the yacht; the other almost hid the huge Consolidated flying-boat as it pitched sideways toward the bay. For a moment he thought one of the bombs had hit it, then through the weird Tetral gas that swept the yacht's deck he saw the smoking muzzles of the A-A battery. The gunners had fired at the same moment—but Hart had blamed the disaster on him!

Desperately, Knight seized the radio switch to call the B-17. But the transmitter had been wrecked by Hart's last burst. The Flying Fortress banked in toward the Sikorsky, hurtled over the yacht and the doomed Four Faces. As the Sikorsky's lights flashed across the bomber's control compartment, Knight saw two men peering out behind the pilot's seat. One was Brett, the other the Chief of Air Corps, General Hugh Bradman.

Knight snatched off the hideous mask and half-rose in his seat. A look of stark amazement came into Brett's face—and in that moment Hart cried savagely through the radiophones—

"Good Lord! Knight is the Four Faces leader!"

A stunned look of horror swept over Brett's features. And as Knight saw that look of final belief in his guilt, a red-hot fury against Hart took hold of him.

"Doyle!" he shouted. "Get that devil!"

A staccato pound from the cabin answered his savage yell. With a violent turn, he whirled the Sikorsky around at Hart's diving ship. For a fraction of a second, the Seversky was boxed between the B-17 and the huge amphibian, and Doyle's Tommy-gun spat a stream of lead into Hart's pit.

With a frenzied zoom, Hart had tried to get clear. His Seversky was fifty feet above Doyle's bullets when the wounded Irishman twitched his last burst squarely up and into the cockpit. A cry of mortal agony came through the earphones.

"Brett—they've finished me! Get—Knight! Sold us out—gave—secrets to Four Faces—"

Across the bright-lit sky, Knight saw the dying man sag into his seat.

"Knight—damned traitor—!" Hart's voice trailed off into a last whisper. "Avenge me, Brett—get—Knight!"

FROM the bow-gunpit of the B-17, two vivid lines of fire flashed toward the banking Sikorsky. Knight's blood turned cold. Brett believed! Hart had doomed him with his dying words. With a desperate turn, he threw the big ship beyond the falling Seversky, briefly blanking the B-17 gunner's fire. Then, lights off, he fled for the shelter of darkness.

The B-17 circled fiercely, lights shifting up and down to pick up the fugitive ship. But that brief head-start had saved Knight and the others. Off to the northwest, the running-lights of the approaching A-18's began to wink. Knight headed east, over the bay and across the eastern shore of Maryland, seeking some lonely spot upon the Atlantic coast.

As he glided toward the beach, Beni-

has discovered so we can find out—"

"Whether to make a run for it, eh?" interposed Barney.

"Not that—but Lang does know all about the Coast Guard guy, and he thinks the Griffon is down."

"He is," grinned Barney, "and I guess we got a break at that, huh?"

"It may work out that way."

BARNEY, after tidying up the room, wandered off to bed; for he knew he had a big day ahead of him. There would be the business of getting back to the cave practically unseen and then making quick repairs so that the Black Bullet could be taken out in the dark the next night.

Keen snuggled down into a deep club chair, packed a huge briar pipe, and sat staring into the glowing fire. There was plenty to ponder on without worrying about old Lang and his ghosts. He was positive now that some one was acquainted with the fact that he was the man who flew the Black Bullet. And he was certain that *some one* knew his moves well enough to get a tip through to the Coast Guard as to where he could be intercepted. They were after him now, hot and heavy, in spite of the fact that he had pulled off many fine shows for them and under cover of his disguise had solved many perplexing mysteries for Drury Lang and the Secret Service. The thing was that the Secret Service did not like mystery men no matter how well they worked—so they were determined to make it very unpleasant for him. Still, there was one happy thing—Lang, apparently, did not even yet definitely connect Keen with the Griffon, regardless of all the pressure that was being brought to bear.

Keen then clamped his teeth on the stem of his pipe, and pondered on the man who had broken into his home. Then he gave a start.

"That bozo must have tipped Lang off to call out the Coast Guard. He knew we would be away and took that opportunity to make a search here."

That reminded Keen of the mysterious hall light phenomenon. He got up, went out and studied the light switch which somehow had been clicked off when he started to enter the house. At first, there seemed no clue. Then finally he caught the glint of a few curly slivers of something on the floor. He stooped down, picked them up between his thumb and forefinger.

Of fairly hard composition, they were similar to cuttings from a fine drill. They were white, and—that was it! The "On" button was white! Had it been drilled in some manner?

He arose and ran the tip of his finger around the edge of the white button and discovered that it had been drilled through from side to side at a slight angle.

At once he caught the idea. Turning quickly, he went across to the other side of the room and inspected a heavy coat rack. From a brass hook about midway up the side of the frame was a string of black thread! He grinned, drew it across the hall—to find that it reached the switch button with a foot or so to spare. At the end of the thread

was a loop which had been broken cleanly.

"So! That's how he did it! Just drilled a hole through the 'On' portion of the switch, then attached the thread with enough slack so that the opening door hit the thread, tightened it, and pulled out the 'On' switch. That snapped off the lights, because the black 'Off' button was pulled in. Since the hole was drilled at an angle, the sharp edge of the button cut the loop of the thread, leaving no evidence at the switch."

Satisfied that he had solved that portion of the ghostly business, Keen then made a thorough search of the cellar and assured himself that the clever intruder had not discovered the secret of their hidden hangar.

Then, realizing that he was very tired, Kerry Keen went upstairs and toppled into bed.

NEITHER the Mick nor Keen did much talking at breakfast next morning. Both felt the strain of hunted men. Keen, after explaining to Barney about the light switch, then gave him complete orders for repairing the main fuel line on the Avia engine. After that, he put on a neat business suit, got into his new Packard roadster, and headed for Manhattan.

The day was crisp and clear, and his camel-hair overcoat felt pleasantly warm as he roared down Long Island for New York City. As he drove, he pondered on his own problem, giving little thought to Lang and his ghost story. All he could think of now was the mystery man who apparently knew his every movement.

The traffic of the city occupied his mind from the bridge to the office of John Scott and Drury Lang, which was hidden amid the hustle and bustle of the downtown business district. And by the time he arrived, he was more in the mood for listening to other men's troubles.

Lang greeted him with something between a sneer and gleam of welcome. John Scott, heavy and ponderous, was running his great fingers through his rusty silver mane. Both appeared to have been up all night.

"Greetings, my merry men!" gagged Keen. "And what little problem besets our Shylocks—pardon, Sherlocks—this fine, crisp morning?"

"Sit down! And that'll be enough of the 'Cheerful Little Earful' stuff," growled Lang. "Now this is Croft—Gail Croft, test pilot for the Dalton outfit," he went on, indicating a man sitting in the far corner of the room. "And this, Croft, is the ninth—or tenth—wonder of the world. In other words, Kerry Keen, ballistics expert and great cheese fancier." Lang's every word reeked with sarcasm.

"You're line is getting good," grinned Keen. "You're much better than you used to be. Who is writing your script now?" Then without waiting for an answer, he nodded genially to Croft, who had unwound himself from his chair to stand up.

"This is the chap Lang told you about last night, Keen," said John Scott, chief of the department.

Croft was a tall, ungainly man, with thinning hair. He had a gaunt look, massive hands, and was loosely knit about the shoulders.

Before Keen even broached an opening statement, the pilot barked: "You can all say what you like—I saw that guy Davis. Yes, the same Lorne Davis who was burned up in the first Dreadnaught crash. I tell you I saw him!"

Keen, somewhat puzzled, glanced at Lang, who said "That's all we can get out of him, and he says he won't fly the damn thing until some one straightens this matter out."

"He was there, I tell you," Croft insisted once more. "He came along, passed between me and Tim Denham, my co-pilot, went down the companion-way ladder under the instrument board, and disappeared into the marine locker in the nose."

CROFT shook as he clacked all this off. And Keen felt sorry for him, realizing that the strain of testing the huge new job was enough for one man without a ghost topping it off.

"Look—here's what he means," explained Scott, shoving a cut-away drawing of the Dalton Dreadnaught before the young ballistics expert. "This is a plan of the thing."

"See," bubbled Croft. "I sit here on the left side. Timmy is on the other side. Then, in the compartment behind us, is Engineer Ed Thorn and beside him is Duffy Hagen, the radio man. And on the other side is the engine panel where Guy Rickard stands watching the dials. He really handles the engines you know from a bridge throttle indicator from my seat."

"I see," nodded Keen, interested in the details of the giant airliner. "Then if Davis passed you here—"

"But the guy's dead!" broke in Croft. "He died months ago in that crash. Burned up! I saw it myself."

"We know all that," admitted Keen. "But this guy who looks like Davis, passed you, slipped under the instrument board, and went down these steps to the marine locker. So what?"

"That's just it! He wasn't in that locker when Timmy went down to see what he was up to."

"You mean there's no way out of there, other than the way he came in?"

"Well, there is one other way—the ladder leading up to the nose hatchway where our beaching man stands to take lines or drop nose anchors. But he couldn't have gone out of there, because I would have seen him open the hatch from the main cockpit."

"All right," said Keen. "But how about this forward compartment directly under your cockpit?"

"No, again! That's to be the officers' quarters when she is equipped for the Navy. But there's a heavy dural bulkhead wall there. He would have to have sawed his way through that."

"There's your mystery, Keen," said Scott. "You figure it out and find that guy. Croft, here, has to complete tests on the ship within a few days, or they'll lose the contract. He's the only fully experienced guy the Dalton outfit has to carry out the tests."

"And I don't want to go aboard that job again until they get that fellow out of there!" blurted Croft.

"You only saw him once?" queried Keen.

"Once? No, twice! You see, when we went up yesterday to do our routine engine test, out he pops again—and this time Rickard saw him. But Ricky was too busy with the motors to do anything about it. Anyhow, two of us saw him."

"I thought you said your co-pilot saw him on that first occasion? Wouldn't that make three witnesses?"

"No. He was twisted around setting a fuse in our beam set fixed under his seat. I told him that a guy who looked like Lorne Davis had just gone down into the marine locker, and he laughed at me. Then it was that I sent him down to look. Well, he came back grinning, said I was nuts because there was no one down there. Then I turned the ship over to him and went down myself just to make sure. And sure enough, there was no one down there."

"What do you make of it, Keen?" asked Scott.

"Don't worry, he'll make something of it," Lang broke in. "He'll dig up that Griffon fellow—or haven't they buried him yet?"

Keen smiled and turned back to the diagram.

"They *did* get that Griffon guy last night, didn't they, Keen?" probed Scott. "Who do you mean by 'they'?" asked Keen.

"The Coast Guard boys. They think they nailed the black amphibian with the Griffon's insignia on the side. At least they saw it go down."

"How interesting! And what did they do with the wreckage?" queried Keen.

"Well, to be frank, they couldn't find the wreckage. But they are certain that plane went down somewhere near Montauk—not far from your place, as a matter of fact."

"You wouldn't know *anything* about that, would you, Keen," taunted Lang.

"Hardly, since I spent most of the night trying to solve a very perplexing mystery of my own."

"Is that so?" came back Lang with deep interest. "What happened?"

"I was working on a cross-word puzzle and I was trying to find a six-letter word meaning pressed curd."

"Pressed curd? What's that?" bit Lang.

"Cheese," replied Keen without looking up from the diagram.

Lang fumed, got up, and stalked about the room. "Yeah, and it'll be cheese that puts you where we want you, Mister Keen," the detective stormed.

"Unless—" prompted Keen.

"Yeah, there's always an 'unless' to it, ain't there? Well, unless you can do something about this ghost guy walking about on the Dalton Dreadnaught. If you don't we're gonner check those cheeses right, next time they come through."

"But I may change my diet," laughed Keen without looking up. Then suddenly he started, and both Lang and Scott, realizing something was up, moved closer to the table.

"What ya found?" said Lang, hang-

ing over Keen like a hawk.

"Nothing—yet. And now let's take a ride up to Bridgeport, eh, Croft? We can make it in a couple of hours in my car," Keen said.

"Okay. But I'm telling you, I saw that guy Davis. I saw him, I tell you!"

"Sure! I think you did too, now. But let's get out of here. This guy Lang gives me the willies. Take him out and get him renovated, will you, Scott. Put him to bed, too. He'll have to be in shape—for he'll get a shock tonight."

"You mean that?" husked Scott at Croft and Keen went to the door.

"Well," said the ballistics expert as a parting shot, "I figure somebody'll get a shock—and Lang's as good a candidate as any."

CROFT didn't offer much conversation on the way out of the city. The gaunt pilot was content to snuggle under a robe and draw on a thick black cigar in an attempt to get some relaxation.

It was not until they were clipping along the Hutchinson River Parkway toward Port Chester that Keen opened up to bring him back to the subject.

"Davis, you say, burned to a crisp in the crash of the first Dreadnaught. But he wasn't alone, was he?"

"No, he had a guy named Mason with him, a fellow who used to be connected with Boeing, Douglas, or some such big outfit. They were both burned to a crisp. Lousy crash, that! Don't know exactly what happened, either. No reasonable explanation was ever offered."

"How did they identify Davis and Mason?"

"Well, they found the two charred bodies."

"A night crash, I suppose?"

"Yeah, why?"

"That kind of 'accident' usually is. What I mean is that they don't really know for sure, then, whether Davis *did* die in that crash. They just found two charred bodies and let it go at that," argued Keen as they rolled along.

"What are you trying to do—make a thriller out of this?"

"That isn't such a screwy idea as you think. And you must admit that soon

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after the first Dreadnaught crash, the Haeffner company in Germany came out with that famous Haeffner long-distance flying boat designed for cooperation work with the Nazi pocket-battleships. You will admit that, won't you?"

"How did you know all that?" asked Croft sitting up as though he had been stung.

"I know it because it so happens that I was called on by the Dalton crowd some time ago with reference to some ballistic tables for their guidance in designing the gun turrets. So I know quite a bit about the ship, and it was easy for me to see that the Haeffner job had practically all the lines, turret positions, and fighting features put into the first Dreadnaught."

Croft stared ahead through the windshield and whistled. A new glow warmed his cheeks, and his eyes sparkled.

"Then it was Davis, eh?" he said. "He didn't really 'check out' in that crash—and now he's come back to get the inside dope on this new Dalton craft!"

"I've been thinking along those lines, yes," answered Keen, sending the Packard along the Boston Post Road at a steady clip. "The new job has many improvements, I gather."

"Plenty! She's a beaut, and when I realize that that guy Davis might be aboard even now—! Boy, I'd like to get my hands on his throat!"

"I wouldn't worry about that. I don't think he was aboard long after you birds landed her. By the way, when do you fly her again?"

"We're slated for a test hop tonight, when the tide is suitable for getting her away from the float."

"I think the tide you want will be about 11:20, or something like that. Anyhow, what tests are you making," asked Keen, his mind working like a teletype machine.

"First, we're going to do a night climb test up to 20,000 feet with a normal load. Then we're trying out a new set of landing lights on a series of landings with a full load. It's all tricky business at night."

"Was that the sort of thing Davis was doing with the other job—when he crashed?"

"Yes. And now that I see it your way, his crashing that flying boat on land makes the whole thing suspicious," said Croft reflectively.

They both pondered on all this until they entered the guarded grounds of the Dalton Aeronautical Corporation at Bridgeport. Keen found no trouble in getting through the gates, for he was well known to certain members of the Engineering staff, and with Croft in the car, the company police were glad to check him in.

"All right," said Keen grimly, once they were alongside the apron from which a large float was moored. "Let's get aboard right away. I want to go over this thing thoroughly."

"Sure. The rest of the crew who work with me will be down in a minute. Come on aboard!"

EVEN KEEN was amazed at the size of the new Dalton product. He had expected to see a large flying boat right

enough, but the Dalton Dreadnaught actually weighed more than fifty tons and had a wing-spread that gave one the impression that here was something only a Jules Verne could create.

"She's a beauty!" declared Keen, once he had taken in her massive size and her sleek lines. "You've got quite a job here, Croft!"

They hurried down the apron and out onto the float. Access to the great cabin was made by way of a portable gang-plank that ran to the open door of the main cabin.

"I'm not worrying about how Davis got off, once you pulled up here," Keen said. "He could have waited until all was clear and sneaked out of one of the many windows, hatches, or ports on the other side."

"Yeah, but how did he get aboard in the first place, and where did he go after he went down into that marine gear locker? That's what I want to know."

"So do I. Come on."

They entered into a bare compartment which, according to Croft, was to be used as a heavy gun turret and ammunition storage space. Two small ports on either side had been cut into the cabin walls for the gun muzzles, but they were now covered up with dural plates which were securely bolted in position. Forward ran a narrow alleyway past the radio cabin on the left and the engine instrument panel on the right. There were two fair sized oblong port holes giving light to the Engineer's stand, but neither of these were large enough for a man to squeeze through.

Farther forward was the bulkhead backing up the pilots' compartment. A small oval door, with latch and lock, gave access to this compartment. Keen studied this layout carefully, then followed Croft into the control cabin.

To go into the amazing detail of the instrument board, the many and varied switches, throttles, adjustment wheels, and other equipment, would take pages. But it was evident that nothing had been left out of this huge skyster that could in any way add to its efficiency.

Keen found that the cockpit seats were set well apart so that there was access to a doorway under the high bank of instruments. Underneath was a dural ladder down into the marine gear locker in question.

"This is where he came through," explained Croft. "Both times, remember! He must have opened the door from the outside, timing it when Timmy was turned away. He actually stood here, pointed a finger at me, and went on through without saying a word."

"I understand," nodded Keen. "Let's go down."

Croft led the way and Keen followed, shutting the small door behind him. The ladderway led down to a fairly clear floor. Another small ladderway, set a few feet farther forward, led up to the small platform under the nose hatch where the breaching officer stood to handle forward lines and direct the anchoring of the big boat.

Keen studied the walls and floors. Apparently, there was no access out of the locker room except back up through the

pilots' compartment or out of the nose hatch.

"There is space beneath this floor, though, isn't there?" queried Keen.

"Sure. About ten feet of open hull with nothing in it. You can get in there from the crew's quarters, which are directly aft of this locker and underneath the control compartment."

Keen frowned and continued to peer about. He remembered the stunt that had been pulled on him the night before with an ordinary piece of black thread and a drilled switch button. That was a trick. And the man they were after had likewise tricked Timmy Denham when he had come down to investigate. He'd put on a disappearing act.

As a matter of fact, Denham came aboard at this point and wandered down into the marine gear locker. Croft introduced him to Keen.

"Still looking for Lorne Davis?" beamed Denham. "You guys are suckers for punishment."

Keen studied Denham, noted that he was a pudgy lad with a grin a quarter of a mile wide. His pop eyes had a perpetual look of juvenile surprise, and Keen sensed that there was no use in trying to get much out of him. But he felt he would like to see this chap. Guy Rickard, who also had seen the man known as Davis.

"Guy is coming along," said Timmy Denham. "He's as nuts as you two. Says he saw Davis, too. I can't understand what these test pilots eat for breakfast, Mr. Keen."

Keen felt that if any member of the crew could be tricked, little starry-eyed Timmy was the lad.

Rickard, the engineer, came down while Keen continued his inspection of the cabin. He was a clean-shaven man who had many of the marks of the sea on him. He had large hands, pale blue eyes, heavy eyebrows and a steel blue chin. A well-built fellow who stood with his feet wide, he was decidedly spit-and-polish Navy and probably a good man.

Croft introduced Keen, and Rickard showed immediate interest.

"There was no question about it, Mr. Keen," Rickard said. "It was Davis all right. I saw him as plain as day. I would have stopped him, but I had just received a dial signal to lower revs on the two outboard motors to 1900 r.p.m. as a test to bring the manifold pressure down. By the time I had adjusted the master throttles, the man had gone—on through into the control cockpit."

"You never saw him come back that way, and you never saw him later in any part of the ship?"

"No—and I never expect to see him again."

"Does that mean you feel you saw, let's say, a ghost—not a live man?" asked Keen, puzzled by the strange statement.

Rickard stammered, seemed uncertain what to say. Finally he replied: "No, that is—well, if it was Davis and he came aboard for something special, he probably has it by now. There'd be no reason why he should come back."

"You are referring to the fact that after Davis was killed in the crash of

the original Dalton ship, an exact replica of the craft was built in Germany?"

"Something like that. I . . . I frankly don't know," said Rickard as if to conclude the interrogation.

"All right," said Keen. "You fellows go back up the ladderway and leave me here a minute or two. I'd like to think by myself."

"Look out for Davis," gagged Timmy Denham.

KERRY KEEN had a particular reason for getting the crowd out of the locker. While he had been asking questions, his eye had caught a short length of black thread near the base of a dural former rib on the starboard side of the locker compartment.

Once the rest were out of the compartment, Keen dropped to his knees and fumbled for the thread, which appeared to extend up from a small space beneath the floor and the hull wall. He pulled at it gently and was rewarded with the unmistakable friction sound of a whirling spool.

He drew back, sucked in his breath. Some one had dropped a spool of black thread down there in the hull bottom, and it had been carried across the cabin, up the landing platform ladder, and into the shadows below the forward hatch.

Could the man who had broken into his house the night before be the man who was "haunting" Gail Croft and the Dalton Dreadnaught? It was a case of black thread in both cases—black thread here on the Dreadnaught, and black thread at Graylands left by a man with a Stinson Reliant!

What was the crazy connection?

Keen stood there holding the thread lightly in his fingers. Of all things, a spool of thread aboard a giant flying dreadnaught! A spool of black thread!

He let the black strand drop and stared down at it again.

"That devil came down here," he said audibly, his mind now fast at work. "He came down here from the control cockpit, carrying the spool of cotton with him. But in his hurry, he dropped it, or it fell out of a pocket. And it rolled down there. Either he didn't notice it, or he ignored it and continued on up that ladderway to the landing officer's platform dragging the thread with him—not realizing he was dragging it. But what the deuce did he go up there for?"

Keen took the thread again now and let it run lightly between his thumb and forefinger. He followed it carefully up the ladderway to the platform. It passed over the black dural-tube railing and continued on up into darkness where the hatchway combing came down below the level of the upper deck.

"I don't get it," he muttered. But standing there in a half-stooped position he let his fingers follow on—to find that the strand passed over the rough edge of the light cork sheathing that formed the inner wall covering of the hull.

Then it all came to him in a flash!

The man had climbed up on the platform railing, eased himself over the edge of the cork wall-board, and somehow had dropped down into the Vee

space between the fore peak and the cork wall. And Keen's closer inspection disclosed that there was plenty of room—for a slim fellow

"I wonder if I could do it," reflected the young ballistics expert.

He took off his hat, buttoned his coat carefully, climbed up on the guard rail, and then let himself over the edge of the cork wall. His feet quickly found the narrow ribs and formers of the hull, and he was able, with but a little trouble, to let himself all the way down to the keel.

He still held onto the thread and now followed it down under the marine gear locker. Then, with the aid of a small pocket flashlight, he made his way along the keel to the small doorway which evidently led into the compartment under the control cabin. By gripping the bar of the latch tightly between his fingers, he was able to twist it and allow the door to open into this cabin.

"Well," he muttered. "Here we are. From here the man could have returned to any part of the ship and hidden until she was anchored here, whereupon he could have left the craft in his own sweet time."

Keen glanced about, then sensed that he still had the thread between his fingers. With a sniff, he now followed it across the cabin and through a narrow doorway which led aft into another room, as yet unfinished, which showed a circular staircase leading back up to the upper deck compartments. He went on up and discovered that the thread led the way to the main alleyway, continued on aft through two more compartments, and there ended its trail.

"He either found it then and broke it off, or somehow it came away from whatever it was attached to on his person," Keen said to himself.

"What a day!" He dug his hands deeply into his trousers pockets and studied the construction of the plane. He marked in his memory every port, hatchway, gun emplacement panel, alleyway, and companionway. He checked the walls and took a few notes. Finally satisfied, he then went forward again to the marine gear locker and retrieved his hat.

HE said nothing of his discovery to Croft or Timmy Denham when he got back to the float. Rickard, the Engineer Officer, had gone back to the main hangar where the skeleton of still another Dalton Dreadnaught was slowly gaining its form.

"Find anything?" asked Croft.

"Not much. But I have an idea. You, will, of course, carry out your plan for the night test flight?"

"I suppose so. But why?"

"It might lead to something, you know. I have an idea, as I said."

"You want to come along?"

"Me fly? Don't be silly!" said Keen with feigned anguish. "You couldn't get me up in that thing."

Croft allowed his brow to crinkle. He couldn't understand this.

"Well, what the hell! I mean, how do you expect to do anything about him—on the ground?"

"I don't know," said Keen staring off

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across the Sound. "But don't worry. I'll get an idea by the time you take off. Now, what time will you leave?"

"As things stand now, about 11:20. But I'm still not very keen about it."

"I wouldn't worry much," replied the young ballistics man quietly. "Something will turn up."

"I'm afraid he will," mooned Croft.

"I hope he will," was Keen's closing remark. "And now I'm shoving off back to town."

Croft watched him climb into the Packard roadster with mingled feelings of worry, fear, and a conclusive reflection that this man Keen was either insane or hopelessly incapable.

BUT Keen did not head back for New York. Instead, he drove on into the city of Bridgeport, down to the waterfront and aboard the ferry that connected the Connecticut city with Port Jefferson, Long Island.

All the way across the Sound he puzzled at the situation, tried to figure out how the man Davis could get aboard the Dreadnaught and why he was haunting Gail Croft, the present Dalton pilot. If Davis was the same man who had ransacked his home, just what was the connection?

Keen had brought a piece of the thread along with him to compare it with that which had been used to put over the hand switch trick at Graylands. If they matched, there would be little question that the same man had pulled both jobs.

The ferry trip gave Keen plenty of time to reflect on several points. But for the life of him he could not figure out how Davis was getting aboard the Dreadnaught at the dock without being seen, or without using some sort of a disguise. His getting aboard somehow during the flight seemed impossible. But if so, how was he accomplishing that trick—and why?

Keen had still found no answer to his problem by the time he reached Graylands. But within fifteen minutes after his arrival, he had satisfied himself that the thread used on the hallway switch was exactly the same type as that he had found aboard the big flying boat.

"So there we are," he pondered, lounging into a club chair. "The guy who is haunting Croft is the same bird who tried to find something here last night. He used a Stinson Reliant with floats to get away from here. Could he use the same ship to make some sort of an unseen contact with the Dalton job? If so, how does he do it—and again, why? Yes, we're up against a very clever gentleman," he concluded as he went to meet Barney, who was now coming up the porch steps.

"How is the Black Bullet?" he asked the Mick as he drew the door open. "Can we get her out tonight by 11:20?"

"Sure! She took a fine beating, all right. But she's ready to fly—if we take some fuel up there tonight."

"Swell! We've got a job on our hands, O'Dare. And let me tell you the yarn. It looks like we may have to kill a man tonight, Barney. I fear he'll get us if we don't."

"I knew one of these birds would get

wise to us one of these days," the Mick groaned as he reached down inside a closet for a bottle of O'Doul's nectar.

Barney then sat and listened spell-bound while Keen outlined the general story. He stared at the two pieces of thread, fingered them—and hurled a startling shaft into the argument—

"So, if he used thread here to pull out a light, he must have used it to do something aboard that Dalton boat. He certainly didn't leave it there for you to follow him."

"Jeepers!" gasped Keen. "I never thought of that."

"It seems to me," Barney went on, making the most of his spot as an advisor, "that he went down the steps from the cockpit, like you said, and there planted the thread first. Then on his way out, while doing his disappearing act, he used that thread to do something. Now you tell me what that was, and we'll be getting somewhere."

"You've got a good idea there, O'Doul. Now you buzz off and let me think. Yes, the question is what was on the other end of that thread? There's the gag!"

Keen then phoned Croft at the Dalton plant and got his word that he would go through with the night test.

"I don't like the looks of the weather, though," Croft argued. "It's all right up here, but they've received hurricane warnings farther south, and the storm is moving north."

"Don't worry. How many tropical hurricanes have ever moved this far north? Besides, you have a big ship, and she can take it, if she has to. It'll be a real test."

"Yeah. But now what about this egg, Davis?"

"Take it easy," soothed Keen. "Act just as you have before. Leave the plane just as she is—except for fueling, and items of that sort—and carry on just as though everything is routine. You'll do that?"

"If you say so, Keen. But I still feel that guy is up to something screwy."

"He is," agreed Keen, "but he'll pull a boner this time. Leave it to me."

"I hope you know what you are talking about," answered Croft hanging up.

"I wish I did," moaned Keen to himself, sitting down after hanging up the instrument. Then he added: "What the devil does that guy Davis want aboard the Dreadnaught?"

KEEN had found no solution to the mystery by the time they were ready to sneak out to the hidden Bullet. They loaded a few cans of gasoline into the rumble seat of the roadster, wrapped up warm, and started out along the sandy road that skirted the shore toward Montauk.

"Queer night," observed Barney as he snuggled down. "Not a breath stirring, and they say a hurricane is swirling about somewhere off the Virginia Capes."

"Let it stay there," muttered Keen. "I'm trying to figure out what was on the end of that piece of black thread."

"Don't ask me," the Mick muttered, "I can only think of one thing at a time."

After arriving near the cave, they hid their car behind a fold of one of the sand dunes along the bleak shore. Then they unloaded the fuel cans, tip-toed across the rocks, and went inside the cave. Then while Keen checked the plane, Barney sloshed around and put the gasoline into the tanks—and the Black Bullet was ready for action.

It was exactly 11:20 when they eased her out of the cave. And at 11:25 she was fighting gusts and climbing into the sky.

"All right, now," said Keen. "There are three things to watch out for—a Coast Guard Grumman, a Stinson Reliant with floats—and the Dalton job."

They climbed in a tight spiral and Keen peered down. His eye caught something, and he handed the night glasses over to the Mick.

"What's that down there over Graylands?"

"Looks like the Reliant—in fact, it is the Reliant," grinned Barney.

"Waiting to find out where we get the Bullet from," Keen said. "This cave business was a lucky break."

With a low chuckle, he then circled wide preparatory to heading toward Bridgeport. Then suddenly Barney screamed—

"There's the Grumman!"

Hardly were the words out of his mouth when he whipped out his guns and trained his sights on the oncoming amphibian. There was a quick flash of tracer and the gleam of cordite flame as the Brownings spat defiance.

"Take it easy," warned Keen. "Not too hard on them."

The Grumman was turning away—for Barney had aimed true. A wing-strut on the starboard side of the C.G. craft had taken the burst full in the lower Vee joint. The same burst, cutting across the nose of the ship, had taken out a variable-pitch prop blade, and the Cyclone engine was almost ripped out of the bearers.

"That's enough!" bawled Keen over his shoulder.

The Grumman was spiralling down, showing all evidence of being out of the play for the rest of the night. True, a few shots were fired after them, but Keen eased away smoothly and watched as two bright sets of riding lights approached from the Bridgeport side of the Sound.

"Here comes the Dreadnaught now. So keep watching for that Reliant. I still don't get it, but something is surely going to click."

"Well, if that ghost guy aboard starts pulling that thread, I'll bet something will click," muttered Barney, still keeping a wary eye on the curling Grumman, which was now definitely out of the show.

"Click? . . . Thread?" Keen half-whispered to himself. "Thread on switch at Graylands . . . Thread aboard the Dreadnaught. I wonder—"

Abruptly, the Black Bullet was caught in a thundering gust that hit her broadside and almost turned her over on her back.

"What the devil?" Barney shouted.

"Some wind! My Lord, what is this?" The Black Bullet was enveloped in a

And then when it was down, he was going to take over, with the aid of another plane, and get it refueled enough to fly it out to one of these mother-ship things a few miles off the coast. But, it didn't come off, though he did have a couple of confederates up in a Stinson plane."

"You mean, the Griffon nipped all that in the bud?" gagged Keen.

"Sure! I'm telling you he was in the air and somehow knew all about it. I'd give a buck to know how he did, though."

"He's a slick artist," agreed Keen, with a grin. "You say he shot a Coast Guard ship down, too?"

"Yeah, but they rode out the storm with a busted engine and were finally picked up by a cutter."

"But how did this guy Davis get aboard the Dreadnaught? That's what I don't get."

"Well, he said something about passing himself off as a Bureau of Air Commerce man checking their test sheets. Then he sneaked off through a port after the plane landed again."

"Is that all he said?" asked Keen; for he knew that Davis had paid a visit to Graylands and that he knew who the Griffon was.

"That's all the poor guy had time to say. The Griffon had filled him full of lead, and he passed out."

"Davis didn't say anything about the Griffon, then?"

"Nope, he didn't."

Keen wiped the perspiration from his forehead. "So I suppose that means you'll try to leave me out of the reward on this show."

"Well, what makes you think you did anything?" cracked Lang.

"You call up Croft and ask him if I didn't tell him to be sure to take off last night. I ought to get something for that. You wanted to nail that ghost, didn't you?"

"Sure, but it was the Griffon who got him—not you."

"But remember, Lang, that you gave out a report that the Coast Guard boys

knocked off the Griffon the night before. You can't tell the newspapers that the Griffon came back to life and did this job. They'd never believe your reports after that. And listen, Lang: If you don't cut me in for a nice slice of the reward money—for my work in an advisory capacity, you know why I'll just bust this thing wide open. I know newspaper men who'll—"

"Damn you, Keen!" husked Lang over the phone. But then his tone eased a bit. "Well, you did have something to do with it didn't you?"

"Just enough to get in on a bit of the reward and you know I do need some cash to buy a new supply of cheese. But of course if they do get nasty about it, well then you needn't call on me again. I'll—"

"Now take it easy," cracked Lang, who was now obviously worried. "Give me a chance to get my breath, then I'll try to do something about it."

"Now you're talking, Lang," chuckled Keen. "And you know my bank?"

"Tell him our O'Doul's Dew dealer, too," suggested Barney.

"But say," went on Barney after Keen had hung up. "I still don't follow some of the things in this ghost case."

"Quite simple, now," replied Kerry Keen. "Davis learned about me when I did that ballistics work for Dalton. A clever man, he apparently shadowed me to get some of the gun info on the job—my angle of it, you know. And his study of my actions finally convinced him I was the Griffon."

"Then he tipped off Lang to call out the C.G. boys—to have me taken care of while he searched Graylands for further gun dope. And he pulled that thread and light trick to mystify me and get me off the track—in case I did get back."

"But he made a boner. He figured I'd be so busy with the light switch clue and the business of the Graylands burglary that I'd turn Lang down if he called me in on the Dalton case."

"And you just didn't turn Lang down!" concluded Barney.

All Questions Answered

(Continued from page 28)

the radial engine is that the rotary had a fixed crankshaft and the cylinders and crankcase revolved about it, whereas in the radial the cylinders are fixed and the crankshaft revolves.

Harold L. Phoenix, Macomb, Ill.:—There are so many types of variable-pitch props that it would be impossible to go into full detail on them here. Some work electrically, some on hydraulic systems, and some on a series of counter-balance weights. David S. Ingalls was America's only Naval Air Service ace. He is credited with five victories.

Robert Shumaker, Takoma Park, Maryland:—Sorry, but we cannot give out such details on the workings of the Flying Fortress gun turrets. Modern interplane struts are generally made of hollow steel tubing. The wheels of the French Delanne fighter retract into the body. The fully-glassed cockpit of the

Martin 166 gives a wider angle of vision for both the pilot and the observer

Jack Fickling, St. Petersburg, Fla.:—According to reliable reports, the Supermarine Spitfire is about forty miles an hour faster than the Hawker Hurricane, and it is now in production for squadron service use. Sorry, but we cannot put girls in more than a very few Griffon stories because most of our readers prefer that those yarns continue to be totally "he-man" in type.

George Kruger, Nampa, Ida.:—An airplane designer is usually a university-trained engineer with a regular degree. He does not require a Government license to practice his profession, but the planes he designs must pass all regulation tests before they are licensed. No flying experience is necessary, but it does no harm to have it—and often does a lot of good. Boiled down, it all

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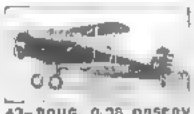
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means that you stand little chance of getting on the designing staff of any firm without a college degree in aeronautical engineering—which means four years of college.

Marvin Wolf, Brooklyn, N. Y.:—See answer to George Kruger above.

Kenneth Stafford, Gilbray, Calif.:—As far as we know, the Seversky fighter is the fastest service plane in the U. S. Army Air Corps. Unofficially, it does 335 m.p.h.

Paul Alberg, Brooklyn, N. Y.:—Yours is probably one of the toughest questions we have ever been asked. We believe, though, that an early Wright bi-plane was the first observation plane used in the U. S. Army Signal Corps. Britain used an early Maurice Farman for observation work, and Germany first tried out a Taube.

Alan Franklin, New York City:—You say you "don't understand Charles Lindbergh at all" because he has, you state, "been asked several times by clubsters of a fine aero organization of his own land—the Flying Aces Club—to become an Honorary Member, but he's never actually accepted. And yet he's now allowed Goering to pin a medal from Hitler on his chest, and the papers say he 'wears it proudly.'" Well, Alan, we dunno exactly what to say to that. But it is true that he's never come into the F.A.C.

Al McKenzie, Sydney, Australia:—I believe the offer to give flying instruction with each new Cub applies only to sales made in the United States. But you might inquire and see if the Australian distributor would make the same offer. Yes, the Spitfire is reported to be nearly forty miles an hour faster than the Hurricane. The Seversky P-35 is said to do "well over 300 m.p.h." It is a single-seater.

Rangi Cross, Whangarie, New Zealand:—The North American N.A.16 picture you sent me is of one of a few such ships sent abroad. It's probably the forerunner of the new N.A. trainers which have been purchased by the R.A.F. The N.A.16 was turned out as a two-seater general-purpose bus using the 550 Wasp engine. The top speed was put at about 210.

William Strachan, Sydney, Australia:—Tony Fokker was a Hollander who was hired to design German war time aircraft. He is still a Dutchman, as I understand it, and has large factories in

Amsterdam. The Stinson tri-motor your people operated was a 1935 type using the 260-h.p. Lycoming R-680 engines. The Page Racer, I'm told, was a Navy fighter converted for air-racing. It killed the pilot because of fatal gas fumes reaching the cockpit. Many high speed fighters and racers have to be landed under power because of the small wing surface.

Peter Boueart, Seaton Park, South Australia:—We shall be most pleased to have you join our club. Consult the "Join the Flying Aces Club" page and follow all instructions. Sure, write us again.

George Grandell, Detroit, Mich.:—The details you ask concerning the "Flying Fortress" are on the secret list and we cannot give out such information as yet. Sorry.

Sam Walker, Chicago:—Mickey Man-nock suffered a congenital defect of the left eye, which, as the years went on, became worse. Eventually, when he returned from Turkey where he was a prisoner during the early months of the war, he became totally blind. Today, no one knows how he fooled the Royal Flying Corps doctors. I believe the Curtiss Condor was the first real aerial sleeper. The Fokker D-8 was supposed to do 130 or so, but there are no official records available to substantiate this statement. Sorry, I have no idea where you can get the plans of the Fairey Feroce or the Miles Magister.

Brian Blakey, Brisbane, Australia:—The Hawker Hurricane carries eight Browning machine guns; four in each wing root. The tactics evolved for planes of such high speed have not been publicized. But more than likely they're the usual tactics, only in slightly wider formations. These planes can strike *en masse* or in three-ship, spear head groups from stepped-up echelon formations. Also, when on altitude duty, from in-line formations when attacking enemy bombers or airships. Their great speed, of course, makes general work in close formations difficult. But I believe the Hurricanes are generally considered interceptor fighters, designed to climb to great heights in a very short time and strike with the terrific force of their gun-power. They had to pass very severe flying tests, and they have safety factors of something around 8 fully loaded. I am sure they would pass the recognized 9-G test. Your suggestion of a new fiction character of British origin is worth considering. And we

might do something about it if it interests our American readers.

Joe Begella, Niagara Falls, Ontario:—Lee Gehlbach, I am sure, can be reached through the Grumman Aircraft Company of Garden City, Long Island. I do not believe Lee is married. He is an American by birth, I understand. However, if you write to him, care of any magazine that publishes any of his many articles, he will, in all likelihood, answer you.

Martin Giforki, Wilbur, Wash.:—If you have a Curtiss Jenny in any sort of condition, I am sure it is worth something as a museum piece. The motion picture companies are always looking for such relics, and perhaps some of our readers might be interested in it, too.

A. Cruz, San Antonio, Texas:—Your letter on flying just after the war was very interesting. I, too, object to World War planes being called crates, for I have a deep sentiment for many of them. After all, with 100-h.p. they did do over 100 m.p.h. And today, with 1,000-h.p. available, they can't do much over 300. So where do they get off calling our old birds, crates, eh? As to airplane kites, I believe they come under the head of toys. You should be able to buy 'em in any good toy shop.

Charles Wells, Albuquerque, N. M.:—I haven't heard that the Marine Corps accept candidates for pilot ratings when they require glasses. I do believe a certain number of trained flyers have come to use glasses after years in the service—but I do not think they accept men who require them *before* they start actual training. The Grumman fighter, I understand, is the fastest plane used by the Marines, and it is supposed to do about 235 m.p.h. You say you like the "Griffon" but do not like "Coffin" Kirk. But the editor tells me plenty of the readers continue to be strong for poor ol' "Coffin," so. . . .

Sam Walker, Chicago, Ill.:—We haven't been able to procure plans for Japanese service planes. We cannot give out performance figures on most planes in the U.S. Air Service. The Hawker "Hind" is a British Army-Cooperation job used on foreign service. It is much like the "Hart." The details of armament aboard the Curtiss P-37 have not been given out. But in all probability, the service types will carry two fixed guns under the cowlings and two in the wings.

BY ARCH WHITEHOUSE.

What Do You Say?

(Continued from page 35)

ish and of no value, they're all wet!

Model building is the world's best way to get a practical, inexpensive knowledge of aviation. For in designing, building, and flying models, one comes in contact with many problems that shed much light on various phases of "big time" aviation.

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I have been a constant reader of FLYING ACES for several years and I

want to say that I think it is "tops."

MYRON HILTON,
Tulsa, Okla.

LIKES THE "TRENTON TERROR"
Editor, FLYING ACES:

I finished building the Trenton Terror from Mickey De Angelis' plans in

lengths of .028 piano wire. Slip them through the drilled nacelles and embed and cement them in the hubs. Insert a couple of washers between the props and the front bearings. The rear hooks are also bent of .028 wire. Glue them solidly to the upper stabilizer's leading edge.

Though it is unnecessary to rig the brace wires in the wings for a flying model, it must be done in the tail booms to help absorb the pull of the rubber motors. A drop of glue is applied wherever the light grey silk threads contact the framework.

DETAILS AND FLYING

SHORT lengths of $\frac{1}{8}$ " diam. balsa dowel are cut and cemented to the top of the nacelles to simulate the four-

teen cylinder V-type Liberty motors. They may be painted black with India ink or dope. Exhaust pipes are made from 1/16" diam. aluminum tubing or reed. Radiators, cockpits, control positions, etc., can be detailed with India ink and ruling pen.

White numerals may be painted direct or cut from paper and doped onto the hull. Strips of red and blue tissue are doped onto the rudders for the official U. S. Navy insignia. And now your NC-4 is ready to be motored.

Four strands of $\frac{1}{8}$ " flat lubricated rubber are used for power. Before flying, check the balance of your NC-4. It should balance level $1\frac{1}{4}$ " from the leading edge of the upper wing. Add a little clay ballast inside the front of the

hull if necessary, reaching inside the cockpit to do so.

Since this ship has no landing gear, select a grassy plot to prevent scraping the hull. Glide the model gently, making minor adjustments by warping the elevators down slightly if the tendency is to stall or *vice versa* for too steep a glide.

Set the center rudder to circle the ship in the desired direction. After a few hand launched check-flights, increase the number of turns, set your NC-4 on the water—and watch her lift into the air. If you have a body of water "bigger than a mud puddle" to fly from, the best fun of all—a landing on the water—is in store for you. But keep your feet dry!

—So They Went to the Navy Boneyard!

(Continued from page 10)

grabbing off orders from the Navy Department for his efficient stressed-skin jobs. However, even though Roy's sky-sters have won wide favor with the Navy, one of them—his XSBF-1—was given the bum's rush. This craft was of conventional Grumman design, but unfortunately it had only a 650-h.p. Twin Wasp Jr. in its nose instead of a heavier engine. The story goes that it was not stressed to take a motor boasting more horses. At any rate, it was too slow for the Navy service with the 650-h.p. plant.

Great Lakes got the boot when they turned out the unwieldy XSG-1. It's reported that these "flying bathtubs" of the old Loening order never solicited many cheers from the Navy pilots and observers of the modern order. So among the seagoing flying fraternity, grumbles were conspicuous by their absence when the XSG-1 arrived at Anacostia on December 12, 1932—and went right out again. Next in line from the G.L. company was the XB2G-1, which bore something of a resemblance to the Grumman XSBF-1. It likewise was shown the exit. Too slow and too heavy!

Northrop won the questionable honor of breaking into this article when in 1936 its artisans taxied out a single-

place low-wing fighter tagged the XFT-1. This one *phffft!* when it proved too hot on landings. Northrop then brought out a cleaned-up version of this craft listed as the XFT-2. A full cantilever monoplane, it was the fastest ship that had ever been submitted for Navy service. But again the admirals barked, "Too hot on set-downs!"

Seversky has batted just once against the Navy—and was struck out for a perfect negative score. The plane in question was the sleek NF-1, sister craft of the Army P-35's. A beautiful ship with very high speed, it was submitted for experimentation in 1937, but the marine judges' verdict was "Ixnay!" For it rated too high on two different counts: First, landing speed; and second, construction cost—\$29,000 per ship!

FINALLY, we come to Vought. This well-known outfit, renowned for its long-standard Navy observation planes, turned out the most strikingly modern plane of the day back in 1933, namely the XF3U-1, a fabric and molybdenum-tubing two-place fighter. But it couldn't take it when they started multiplying the gravities in a power dive at Anacostia. Its wings neatly closed around

the fuselage in an inseparable embrace. So the order was something off the fashion of, "Haul that pile off the field—and don't bother to save the blueprints."

Then in 1936, Vought built their own version of the XF3U-1, plans for which they'd purchased from Douglas. Excellent in workmanship, this was the XS3U-1. But instead of being excellent in speed, it was slow. Rejection was the result. We might add, too, that even Vought's fine observation busses didn't hit the target every single time. And you can take the discarded XO4U-2 for an example.

Of course, the companies we've named here aren't the only ones that have come a cropper, aeronautically speaking, because of our Navy's rigid aircraft qualifications. But their experiences have served to illustrate our point.

So when you read all the hoop-de-doo about the marvelous new war planes that have come along, you can take it all with several grains of salt and divide by two—if not three. While our Navy boys test 'em, all right, actually taking them is something else again. And when they *do* take 'em, you can be blamed well sure that they've got something—really swell planes that fill the bill!

And Now For Spins!

(Continued from page 17)

more smoke than fire there. You hear a lot of talk about flat spins, how dangerous they are, and all that. But I can't get overly excited about 'em. I've flown planes of a type which have been known to have flat spin characteristics, yet my experience with them leads me to believe there's no excuse for flat spinning. I've never known of a ship that went into a flat spin immediately. They all made a turn or so of a normal spin before beginning to flatten out, and they all give a warning before hand."

"A warning?" queried the student.

"Yes. You'll find, Jack, when you spin this ship of ours, that the stick must be held back. It doesn't want to stay there. It wants to go forward because there is a very definite pressure

there. Well, that's true of any plane as long as the spin is normal.

"However, when a plane has a tendency to flatten out in a spin, that stick pressure reverses. Instead of wanting to go forward, the stick wants to *stay back*. And that's your danger signal. In short, you're okay as long as you have to *hold* the stick back.

"But the instant that forward pressure slackens off—look out! Don't wait. Don't hesitate. Jam the stick forward immediately and give her full opposite rudder. That'll stop the spin before it has time to flatten. Heed the warning of slackening pressure on the stick, and you can nip a flat spin in the bud. Remember that!"

"You bet I will!" promised Jack.

"All right! I'll give her a crank now, and we'll taxi down and get the chutes. Then we'll go up to about 5,000 and twist her tail . . ."

CONROY "WINDS HER UP!"

ABOVE 2,000 feet the air smoothed out, and Jack Conroy settled himself more comfortably in his seat. His tension now was gone. At Macklin's suggestion, he then experimented with the stabilizer adjustment until the plane was trimmed to maintain her angle of climb "hands off." The ground kept dropping away, and the farther they got from it the better Jack liked it and the more at ease he felt. Finally, they reached the 5,000 foot mark, and Macklin, shaking the stick, took over.

"All right, Jack. Stay on it lightly and follow me through. We'll kick her off in a right spin. *Watch!*"

Back came the throttle to shut the motor down, and back came the stick. Without power the nose lifted lazily. Macklin held her in a climbing position until the sodden, sluggish feel of an approaching stall was evident even to his student. Farther and farther back came the stick until it was right in Jack's stomach.

"Now!" barked Macklin.

The nose was beginning to waver; it started to drop, instantly, Macklin boot- ed on full right rudder. The nose swerved sickeningly to that side. Then, swiftly as though some outside force had taken hold of the plane, she be- gan to rotate. Slowly at first, then with increasing rapidity, she "wound up." The nose remained well down and ap- peared to be the axis around which the tail swept in a wide arc.

To Jack, the physical sensation was not nearly as bad as in a whip-stall. He was not lifted from the seat, nor did he have that whip-stall feeling of falling away from his stomach.

But try as he would, he could not make his eyes keep pace with the dizzy evolutions of the plane. To him, the whole world looked like a gigantic multi-colored phonograph record being whirled on the turntable of a mammoth Victrola. He rapidly became dizzy. And when Macklin spoke through the Gossport, telling him to follow the recovery carefully, he couldn't have told whether the ship had made two turns or twenty.

He lowered his head to concentrate on the controls, and he found that taking his eyes from spinning earth steadied him considerably. He now noted that Macklin was neutralizing both rudder and stick, whereupon the rotation stopped and Jack became aware of a new acceleration as the plane assumed a straight diving attitude. He felt Macklin ease the stick back, and he looked up to find that the plane again was in a normal, level position.

The instructor revved the motor up for a minute, then again throttled it. "Your turn," he said crisply. "Pull that nose up . . . Now hold her there—hold her 'til you can't hold her any longer . . . Come on, Jack! Work that stick back . . . Now we're getting some place . . . Watch her when the stick is all the way back. Just as the nose starts dropping in a stall, boot on full right rudder . . . Get ready! . . . All right! Let her have it!"

Holding the stick back to his belly, Jack, as instructed, straightened his right leg on the rudder at the instant the nose started to drop.

There seemed to be just a moment of slackness—a moment of wishy-washy slithering to the ruddered side. Then, with a firm hand, Old Man Auto-rotation took hold! The plane took the bit

in her teeth and really wound up!

Try as he would, Jack could not altogether fight off a surging wave of dizziness, but automatically he responded to Macklin's steadying voice.

"Okay, Conroy. Let's come out of it . . . Stick neutral! Rudder neutral! . . . That's it! Now the spin is stopped and we're diving. Easy on the stick, now. Back a little—that's it! Bring her up level, then open your motor to cruising."

Jack squinted at the horizon, which as yet seemed anything but stationary. However, it finally settled down as his dizziness rapidly left him, and he had no difficulty in keeping the little tramer buzzing along in a respectable manner.

Macklin took over and allowed him to rest while lost altitude was regained. When it was, the instructor ordered him to try a left spin, and the student accomplished it satisfactorily. From then on, for the rest of the session, it was spin, recover, climb; spin, recover, climb—until at the last Jack had become accustomed to the whirling, dropping movement. He could now make recovery after a given number of turns without help—either manual or verbal—from Macklin.

When it was all over and they were on the ground again, Conroy was immensely elated.

"Say! That really was something Mac! I really learned a lot today. Why, in that last spin we did three full turns and I was hardly dizzy at all!"

"Yes, you did right well, Jack," complimented the veteran. "Your work in the air today proves that there's nothing the matter with either your nerve or your ability to handle a ship. You see, that difficulty you are having with landings is purely the result of a mental attitude. And that attitude, as we agreed earlier today, is based on an illogical association of ideas. You must, Jack—you simply *must*—convince yourself that our crack-up of two weeks ago had nothing to do with landings!"

The mention of landings sobered Jack instantly. "I'll try, Mac. I'll try like the very dickens!"

"Okay, kid. I know you will. And if you get yourself in the proper frame of mind, next week we'll really cure that landing fever of yours once and for all!"

"You bet we will!" responded Jack Conroy.

But his enthusiasm seemed a little forced, and there was a worried look in Macklin's eyes as he waved "so-long" to his departing student.

Chet Mucklin really goes to work on Jack's ground shyness in the thrilling ninth hour of our popular fictionized flying course. And that's something you prospective skyemen can't afford to miss—so be sure to be back here on the tarmac with us next month.

Flying Aces Club News

(Continued from page 27)

Charley Trask, of Keene, N. H., recently sent in a souvenir—a piece of dural from a washed-out ship. A new member of the F.A.C., Charley also

forwarded an interesting resumé of
aero activities in his home town. He'd
like to contact other F.A.C. members
in Keene, so those of you who wish can

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Per 100	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 5 ft. 20c	3/4" O.D. 6 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 7 ft. 20c	3/4" O.D. 8 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 9 ft. 20c	3/4" O.D. 10 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 11 ft. 20c	3/4" O.D. 12 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 13 ft. 20c	3/4" O.D. 14 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 15 ft. 20c	3/4" O.D. 16 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 17 ft. 20c	3/4" O.D. 18 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 19 ft. 20c	3/4" O.D. 20 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 21 ft. 20c	3/4" O.D. 22 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 23 ft. 20c	3/4" O.D. 24 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 25 ft. 20c	3/4" O.D. 26 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 27 ft. 20c	3/4" O.D. 28 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 29 ft. 20c	3/4" O.D. 30 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 31 ft. 20c	3/4" O.D. 32 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 33 ft. 20c	3/4" O.D. 34 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 35 ft. 20c	3/4" O.D. 36 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 37 ft. 20c	3/4" O.D. 38 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 39 ft. 20c	3/4" O.D. 40 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 41 ft. 20c	3/4" O.D. 42 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 43 ft. 20c	3/4" O.D. 44 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 45 ft. 20c	3/4" O.D. 46 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 47 ft. 20c	3/4" O.D. 48 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 49 ft. 20c	3/4" O.D. 50 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 51 ft. 20c	3/4" O.D. 52 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 53 ft. 20c	3/4" O.D. 54 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 55 ft. 20c	3/4" O.D. 56 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 57 ft. 20c	3/4" O.D. 58 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 59 ft. 20c	3/4" O.D. 60 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 61 ft. 20c	3/4" O.D. 62 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 63 ft. 20c	3/4" O.D. 64 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 65 ft. 20c	3/4" O.D. 66 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 67 ft. 20c	3/4" O.D. 68 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 69 ft. 20c	3/4" O.D. 70 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 71 ft. 20c	3/4" O.D. 72 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 73 ft. 20c	3/4" O.D. 74 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 75 ft. 20c	3/4" O.D. 76 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 77 ft. 20c	3/4" O.D. 78 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 79 ft. 20c	3/4" O.D. 80 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 81 ft. 20c	3/4" O.D. 82 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 83 ft. 20c	3/4" O.D. 84 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 85 ft. 20c	3/4" O.D. 86 ft. 20c
1 lb. 35c	100 lb. 35.00, 100 lb. 85.00	3/4" O.D. 87 ft. 20c	3/4" O.D. 88 ft. 20c
1 lb.			

write him in care of GHQ. We'll forward your letters.

And now I'm going to wind up the current Club News by introducing an F.A. Ace who has a "different" hobby—Wilfred R. Pobursky, of Detroit. For some time past, Wilf has been making cardboard replicas of all medals re-

ceived by pilots in the World War, and his collection includes the official awards of the United States, Great Britain, France, Belgium, Germany, and Russia.

If any Clubster has pictures or accurate drawings of the German *Pour le Merite* and Iron Cross, or awards pre-

sented by World War nations other than those listed here, Wilf would be mighty grateful if he could borrow them long enough to copy them. His address is 15038 Bramell, Detroit. (But anyway, Wilf, why not try the Detroit Public Library?)

S'long, Skysters!

Construct the Navy Brewster XSBA-1

(Continued from page 31)

A part of each wing, nearest the root, is painted black (See the front view drawing). Landing gear may be painted silver. The gunsight tube directly in front of the pilot is painted black.

The propeller is silver. Ailerons, tabs, and flaps are indicated by black India

ink lines, drawn in with a ruling pen. Note that the flap line appears on the bottom surface of the wing only.

To fly the model XSBA-1, use four strands of $\frac{1}{8}$ " flat rubber with about one inch of slack. Wind, and glide the model into the wind. The ship should

make a perfect three-point landing if correctly balanced. If the glide is imperfect, balance the model with clay or correct the line of flight by warping the tail surfaces.

Examine the model after each landing to prolong the life span of the ship

A Haunting We Will Go

(Continued from page 14)

"*Sacre, Pheenyas,*" she exclaimed. "What ees thees which have scare' you, non?"

"When was *you* born?" Phineas asked in a hurry.

"Ah, *mais oui,*" Babette replied, all smiles. "*Le sixieme Novembre, Pheenyas. Pourquoi?*"

"Sagittarius? Sagittarius?" Phineas let out a howl and leaped for the door, tossing his cigarette away as though it might impede him. It landed on the heap of thin dress material lying on the table. "We can't be in ze same *maison* this week, mawn cherry. He-e-ey, the door is stuck! Lemme out, Babette, as it is awful bad luck. One of us might kill ze other, comprenny? What's the matter with this do—"

"*Crazees vous ete!*" Babette shrieked at him. "Peeg! Look — *regardez!* Ze *nouveau* gown I have make. Ze hole you burn *dans* ze checfon! *Bah-h-h, allez vite!*"

Phineas' light of love then picked up a skillet. Her swain pulled violently at the door and it flew open suddenly. The article of kitchenware followed him out into the hall, overtook him, and clanged against his pate. Babette had made a bull's eye! Unfamiliar with the Zodiac, she was unaware of the fact that she had been born a marksman. For Sagittarius is—The Archer!

"*Sacre bleu!*" she raged. "Ze *belle* gown ees ruin, bah-h-h-h!" She snatched the thin creation up from the table and threw it out the window. "Nex' *temps* I see ze peeg, I keel heem!"

Phineas quickly went over and entered the lair of Madame Mazola. It was a clubby, albeit spooky, tepee. *Vin blanc* and *vin rouge* decanters stood on a table in a dimly lighted makeshift reception room. A bell tinkled when Phineas closed the door behind him, and the medium appeared almost at once.

Madame Mazola was a meatless female clad in a long black dress. She wore a hood of the same ebony hue, and the face it shadowed resembled a wedge of restaurant pie. Her prop boss was sharp pointed, and the eyes that stared at her latest caller looked as though they could count the vertebra in his backbone.

"*Bon jour, M'sieu.* Lieutenant Pinkham, *oui?* You wish to know the future again, perhaps?"

Phineas tenderly massaged his bruised noggin. "I got a good bump here you could read," he grinned as he followed the clairvoyant into the mysterious inner sanctum of the ghost-baiting bazaar. "But I will be satisfied with gettin' in touch with my Uncle Thaddeus who got scalped by Indians once. Ask him how is every little thing, huh?"

"I'll try," Madame Mazola said in a ghostly voice. "There all the lights are out. Let me go into a trance. Be still . . . very . . . very . . . still . . ."

"Ye—yeah—er—" Phineas hardly breathed for fully five minutes. The stillness was first broken by a faint squeak. But though he yearned to tell his little rodent to shut up, he restrained himself. Suddenly a quick tapping sound lifted the hairs straight up on the Yankee's cranium.

The medium mumbled: "Ah! The spirits move. *M'sieu.* Sh-h-h-h-h!"

Phineas felt little feet patter across his arm. He made a pass at the mouse in the dark and missed. The tapping came again, then Madame Mazola said: "I am in contact with your dear departed relative. Speak to him, *M'sieu.* What do you want to say to him?"

"Hello, Uncle Thaddeus," Phineas gulped. "What do they feed you where you are, huh?"

From somewhere above came a reply: *Manna, Phineas. And the nectar of the g—*" The voice was suddenly smothered and Madame Mazola coughed as if a fishbone had been caught in her throat. A light snapped on, and the medium's eyes looked glassy.

"It is not the time for contact with the other world, *M'sieu!* Tonight, later, perhaps—I am sorry, *M'sieu!*"

"Huh — er — awright," Phineas grunted. "Here's a couple francs, anyways. As long as I know Uncle Thaddeus is doin' awright, okay. And now, if you don't mind, Madame, I lost a little pet mouse here some place. Maybe it went under the table an'—" He got down on his hands and knees and started to wriggle underneath the article of furniture. A faint rapping sound came

again and Madame Mazola's voice intoned: "I'm sorry about your pet mouse, but you must go now, *M'sieu.* My sister wishes to speak with me. Always this time of day—"

The Boonetown jokesmith felt his spine unraveling and he got to his feet in a hurry. "*Oui, oui, Madame!* I beg voos pardon. I'll be back *ce soir.*"

Out in the reception room Phineas paused and poured himself a stiff drink of *vin blanc*. While he was imbibing, a coal black cat trotted in, whiskers quivering and nose sniffing at the ozone. Phineas sidestepped it, then put down his glass and went out.

On his way back to his Spad, he got to wondering about the spirit that had suddenly refused to talk. The black cat worried him, too.

It was a mile to where he had left his battle wagon, and when he crossed the field, he spotted a hound dog chasing a rabbit. The rabbit, beginning to lose the race, suddenly went into an Immeimann, however, putting the canine into a skid that knocked it off its undercarriage long enough for the big-eared bunny to whisk inside a hollow log.

"Haw-w-w-w!" the A.W.O.L. Yank laughed. "That's kind of cramped for the bunny, so surely that pooch'll never get his shoulders in. Well, back to my C. O.!" Phineas yawned.

But his lethargy dropped away briefly as he turned to look back at the log where the rabbit was thumbing its nose at the Frog mutt. A section of the Pinkham brain cells suddenly began to operate, and a dubious grin appeared on his unmatched pan. "Hm, I wonder?" he pondered.

THE OLD MAN was fit to be tied when the wonder worker of the outfit set his Spad down on the field. Sergeant Casey informed Phineas that Captain Howell had been forced to ground his bus on the roof of a Frog barn near Revigny. The flight leader was in his hut talking to himself. "He got side-swiped by a Boche slug, an' his marbles ain't picked up yet. They got Lieutenant Gillis over in a base hospital. An' they are havin' a time gettin' him straightened up, as he was all bent

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and tossed, whined and squealed, groaned and moaned.

"I'll kill somebody for this," Phineas yowled: "Casey—if I ever get back—you bums; Tellin' me the place *wasn't* Varche!"

A remnant of shrapnel hit him on the noggin just then and made him do things with a Spad that no man in his right senses could have coaxed out of one. When the Iowa marvel got the fog out of his brain, he was hedgehopping a Heinie settlement. One wing swept a Jerry off his feet. A tin pail spun through the air and bounced off the Spad's strut. Fragments of something stung the Yank's face as he frantically backticked. Some went into his mouth and he chewed on them.

Regaining a few thousand feet, Phineas thought he was in the clear. But then three Albs pounced on him. He tried to make a run for it, but the Potsdam pugs crowded him against the sky ropes and shot in punches to the Spad's mid-section before he could blink. He banged left rudder, felt something interfering with his boot. Kicking at it crazily, he suddenly remembered that it was a big book that he had put inside the pit three days back. It was called *Dr. Oblesby's Astrology For All*.

Yanking the stick back, Phineas sent the Spad into a loop, and the big tome dropped out of the pit, plummeted down through the ozone, and hit a Von right on the square head!

PHINEAS managed to shake off the remaining Albs and slip into friendly ozone just as darkness surrounded him. He looked off to the right, saw something fluttering through the sky that made his teeth chatter and his hair crawl all over his pate. A filmy, decidedly ghostly substance was slowly settling earthward.

"Ectop.asml!" the credulous Yank gulped. "I bet it got loose from Mazola, an'—" He circled, trying to keep his eyes on the slowly descending supernatural phenomenon. The wind was whipping it around some, so that Phineas got slightly gaga trying to follow its course.

"It—it must be the ectoplasm from the spirit of St. Vitus," he decided as he kept losing altitude. Quickly he gave the Spad the gun and dived in so that his wing tip snagged the ectoplasm and kept on going down to the carpet with the stuff streaming out from his strut. The Spad's wing then buckled and Phineas landed in a heap three miles from Bar-le-Duc.

A bunch of Yankee doughs near Vaubecourt had watched the Spad stagger over their heads with top wing apparently smoking, and they agreed that nothing human would ever step out of it with a whole neck. They passed the word along to Divisional Headquarters, and in due time the phone in Major Rufus Garrity's business office buzzed. The Old Man was told that a crate had crashed somewhere between Vaubecourt and Bar-le-Duc and that it must have been one of his.

"The crate was singed," ran the report. "The top wing was wobbling like a hangnail. You better send out the dead

wagon and pick up what's left. Good-bye."

The Old Man banged down the phone, looked at the R. O. "Get a cablegram ready to the Pinkhams in Boonetown, Iowa. Phineas has used up his ninth life. He couldn't expect to—don't just sit there! Do somethin'! Ah-h-h-h-h-cr-r-r-ripes!"

Twenty minutes after his crash, Phineas Pinkham's eyes uncrossed and he began to gather up his marbles from under a tree. There was a familiar taste in his mouth as he became aware that his jaws were moving rhythmically upon a mealy substance.

"H-Huh," Garrity's mental hazard grunted, "that was a funny place I just come back from. A dozen Heinie jalopis there! A big pole with wires—" His musings ceased when something brushed against his face. A diaphanous substance that settled into his lap.

"Er—ugh—ectoplasm, I bet," he stutted. "No-no, it looks like—" He picked up what turned out to be a filmy heap of cloth, and he examined its fabric closely. Then Phineas' helmet lifted and nearly broke its strap! In the cloth was a small hole, the edges browned as if by a hot coal. "Babette's gown—well, I'm a—for the luvva—slap my brains out. Now what—things git rotten in other places besides Denmark, I bet!"

In a short while, the only son of a long line of only sons in the Pinkham lineage had a herd of wild thoughts corralled. He had added up the events of the last two or three days, and the sum total staggered him. "I know all about it now," Phineas ejaculated. "Why spirits rapped at me. What I been chewin' on! Why Uncle Thaddeus was gagged when he tried to—Haw-w-w-w-w! And that Zodiac stuff is a fake, as I am alive right now. Just the same, I will slug Casey. I have to get out of here. I've got to see Babette. The Hemies are smart, huh? They forgot that a Pinkham is still around."

Ruminating thus, Lieutenant Pinkham trekked into Bar-le-Duc with a limp slowing him down a bit. He demanded entrance at the door of his heart throb and got it. It was necessary to duck a skittle or two, but he made it. One question after another tumbled out of his mouth. "I was only kiddin' the other *jour*, cherry. Lissen, what did you do with the dress I burnt, huh? Answer *vite vite*, as it is for the Allies, comprenny?"

Babette finally calmed down and told Phineas she had thrown the ruined garment out of the window. The next morning when she had experienced a change of heart and had gone to look for it, alas it was gone.

"Ah-ha!" Phineas said, snapping his digits. "And was there a seance in Bar-le-Duc that night, huh?"

"*Mais oui*," Babette said excitedly. "Madame Mazola she have ze beeg crowd. *Un general et beaucoup* officers. She breeng ze spirits, *et* I see ze white ghost fly through ze air, Pheenyas. Over top from ze roofs *et* into ze night, *oui*."

"Well, now I know something," Phineas yipped. "An' this time it is no bull. Haw-w-w-w-w! Ectoplasm, huh? An voices from above! I guess all the

Allies was born under Pisces, as what suckers they have been! Ado for now, mawn amoor, as I can't wait."

Phineas Pinkham appropriated a motorcycle that he found outside an *estaminet* and rode to the Ninth Pursuit Squadron at record speed. Sergeant Casey saw him first and he extended an investigating finger to touch the lieutenant's hefty chest. "It ain't you, Lootenant, is it?" he gulped. "It can't be!"

KERWHOP!

"That should convince you, mawn rat!" the returned Yank snorted. Then he limped toward the Operations Office. "Lieutenant Pinkham reporting, sir," he blasted the Old Man's privacy. "And with the situation well in hand—that is, almost. I know now why I told you the truth yesterday—and how the Kraut bums have been puttin' aces up their sleeves. It's the juice—the juice that makes a guy sleepy so he doesn't have pep enough to think up lies. Anyhow, I want you to arrange a seance with Madame Mazola tomorrow night, an' it will be some fun! Invite some red tabs and some Frog officers, too, as I want witnesses. I think I will take over the old gal's business Haw-w-w-w-w!"

"You're crazier than usual," Garrity bellowed. "Get out of here. You're still under arrest. Why didn't you get killed like they said, huh?"

The Recording Officer came in then reading from a slip of paper. "How does this sound, Major?" he asked, without looking up. "We regret to inform you of the death of your brave son while—Awk!" The R. O. had glanced up and seen Phineas. He dropped the cablegram and tore out of the office as though he had seen a ghost.

MAJOR GARRITY changed his mind during the night. In the morning he informed Lieutenant Pinkham that he would go through with the seance. "You know something, fat-head!" he gritted. "I've got to find out what it is. All I say is you'd better know!"

"Was I ever wrong?" Phineas queried loftily. "Haw-w-w-w! well, I must go over and look through my trunk for something," And he strutted out jauntily.

That night the citizens of Bar-le-Duc sensed that Madame Mazola was going to extend herself. Imposing looking officers from three armies trickled into her mysterious parlor between the hours of nine and ten. Twenty brass hats and Lieutenant Phineas Pinkham ringed the big circular table when the medium put out the lights and got to work. In a ghostly voice she told her customers to join hands. Phineas thrust a clammy hand into the big flipper of a Limey general and Mazola announced that she was going into a trance.

In a few moments she groaned: "I hear someone . . . calling . . . calling a name. General Rhys-Boylngne. Does the General know who—?"

"My poor departed brother," sighed the Limey red tab. "How are you Jeremy, old thing?"

"*Top'ole, old pip-pip*," a voice came

right from the general's lap. "Haw-w-w! Nice bit of fluff—I mean girl—I saw you with in Nawney, what? Tsk! tsk!"

Madame Mazola was making a queer sputtering sound. The Limey general wanted to know the meaning of the outrage, whereupon the clairvoyant announced that the seance was at an end, and that spirits had no sense of humor. Her contact with the spirit world was broken. They could all clear out. But twenty nervous systems strummed when a voice floated down from somewhere above the table—

"Haw-w-w-w! I am a spirit and I want to play. Wait, bums, as here I go!"

There was an almost inaudible click, then up through the darkness sailed a ghostly white substance. It fluttered over the heads of the assemblage and Madame Mazola let out a frightened squawk.

BANG! cracked a gun, and the ectoplasm stopped in mid-air, then dropped down and settled in Major Rufus Garrity's lap. The Old Man pushed it to the floor and hastily kicked back his chair. "Lemme out of here! I'll kill anybody who stops me. Lemme—"

Madame Mazola was out of her chair, too. But Phineas Pinkham had a grip on her leg and he pulled her off her feet. Still clutching her appendage, he found a light switch and snapped it on. Red tabs and Frog brass hats stared in wonderment. Phineas was sitting on Madame Mazola and he held a hood and a wig in his hand. Mazola, as bald as the crystal ball standing on the table, was protesting violently.

"Haw-w-w-w-w!" Phineas guffawed. "Here's your Henrie snooper. He does not seem to be in good spirits. Get it? Haw-w-w! That free *vue blanc* and *ou rouge* out there were loaded with stuff that makes bums tell the truth, and this Kraut pumped officers and doughs after they had gulped a snifter. I got wise the day I came here to talk to my uncle, as I had a field mouse in my pocket and it got loose. Anyhow, tip over the table, as there is a rubber tube there that Mazola does her talking through. It goes up to the ceiling if you follow it, and that is why her voice came from above! You see, I saw a dog chase a rabbit into a hollow log. And when I did, I says to myself, I bet my mouse got caught in a tube, as just after it got loose, the spirit of Uncle Thaddeus got choked."

Garrity was at sea. "Huh?" he yipped. "Talk sense, will you?"

"Gimme time," Phineas chided him. "Well, the day I had the seance, I called on Babette and found out that she and I didn't belong in the same house at the same time as she was under the influence of Sagittarius—"

"Never heard of the stuff," Garrity cut in. "Maybe you mean absinthe."

"I said Sagittarius, who is The Archer," Phineas replied. "Taurus and him could not get along this time of year, so I ran out on Babette, an' I threw away a cigarette, and it burned a new gown she was sewin'! She threw it away, and a piece of it fell down into my lap just after I cracked up on my way back from Varche. It had a hole

in it—burned there by a cig, you see. "Do you understand? This Kraut, Mazola, ran out of ectoplasm and had to get something new. He mooched around Bar-le Due looking for dress goods and found some in Babette's back yard. He cut it up into ectoplasms and put one around the neck of a carrier pigeon when he wanted it to take off to Varche. It was fastened loose so it would get torn loose by the wind when the pigeon got a mile or so from Barley Duck. In the dark you couldn't see a pigeon's head stickin' out. Look at the dead pigeon there on the floor; its head is stained black. Haw-w-w, an' I shot him down without even havin' a haunting license! Get it?"

GARRITY growled and Phineas hastened to take up his story lest he get socked. "Mazola kept the pigeon under the table in a box an' it had a chiffon dress on. The ectoplasm always disappeared through a window, didn't it? And it looked real, awright."

"Well, I'm a—" A British brigadier picked the dead pigeon up and searched it. A tiny capsule was tied to its leg and he opened it up. In diminutive writing it told the location of Yankee billets in back of Commercy. "He's done it, Garrity!" the red tab enthused. "The Lieutenant has exposed this German agent. Well, we've got you, you smart Dutchman, eh, what?"

"Ach Gott! Always Pinkham," the spy growled. "For years I have fooled people with my impersonations. When war started, we put Madame Mazola in jail and I told der Kaiser—in his agitation he lapsed into broken English—dot I should be das Mazola und gedt offer der lines. *Himmel, for drei years I practice mit der spirits, und—Donnervetter!*" he groaned. "*Herr Lieutenant Pingham der deffil ist. Efen me—Gottfried von Liverwurtz—cannodt fool him yet. Bah-h-h-h!*"

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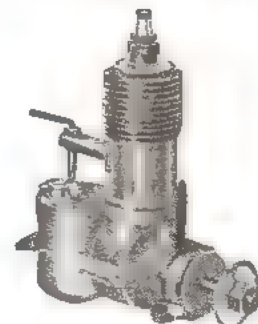
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"I knocked over a Kraut with my Spad over in Alsace," Phineas went on, chuckling. "I got cracked corn in my face and when I got a taste of it—haw w-w-w! Your black cat looks plump, *ce swar*, Mazola. I bet that field mouse tasted good, huh? The rappings I kept hearin', you sausage hound, were made by that pigeon's beak picking up corn in the box. It's awful how so many people are suckers, huh? Fallin' for this stuff—haw-w-w-w-w! They had me believin' it, too. Why just look how many different bums are in the same house at this time? Scorpions, rams, lions, fishes—an' cr-r-rabs! They could not all be on the astral throne at once. So it's a fake, awright. I—"

CR-R-R-R-R-R-RASH!

The roof fell in. Plaster pelted down on frantically milling brass hats. Phineas dived under the table three seconds before a rafter hit where he had been standing. The crystal ball rolled off the table and bounced off Garrity's head, and the C. O. of the Ninth got a look into the future for fully five

minutes. When somebody found a light, Phineas looked around for the Von. The Kraut's head was protruding from the top of a pile of plaster and two big boots jutted out from another part of the heap of debris.

"Come out of there!" Phineas yipped, and pulled and tugged. The Von's head stayed where it was. It was a Frog general who owned the feet. M. P.'s and gendarmes came running in and started sorting the mess. Phineas slumped down on a piece of timber and jettisoned a mouthful of plaster. "N-Nothin' happened, huh? M-Maybe I'm wrong. I will not move back into that house with Pisces yet—to make sure. Let's see—Taurus is in the ascendancy—on the throne between—it falls durin'—oh, my neck! It feels broke. That means that—"

"Git this lieutenant here," a stretcher bearer yelled. "He's went nutty. Hurry!"

But the scion of the Iowa Pinkhams got up, pushed the rescue workers aside, and hustled out of the spirit hangar. He found a motorcycle, kicked it into life,

and rode to the nearest bombing squadron. He called the Old Man up from there two hours later.

"I have told the egg layers where they can tag the Kraut snooping factory—the place I found where they got a big radio, an' all," he bawled into the mouthpiece. "But as for me, I will not be back until it's safe for me to stay under the same roof with a crab, as that is you."

"You come back here, you fathead!" the C. O. roared.

"You want to look out, too, Major," came back over the wire, "as it is a terrible time for you to be close to a scorpion like Howell. It's awful bad luck, an'—"

Garrity's apoplectic reply was broken off when an orderly came in and handed him a registered letter. He ripped it open and read:

"Dear Rufe: Something terrible has happened. Your house burned down. Your dog, Rover, got distemper and they had to shoot him. That oil stock we bought is all a fake. I think my asthma is coming back. Your loving wife, Sarah."

The Major dropped everything and yelled for the orderly. "I'm right h-here, s-sir," the fellow quaked.

"Get Captain Howell. Hurry up. Take the lead out of your pants. Oh-h-h-h, cr-r-r-ripes!"

Howell reported two minutes later, and Garrity said: "Pack your bag. You've got two weeks leave. Get out of here!"

The flight leader nearly fainted, pulled himself together, and reeled out of the Operations Office.



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Light Plane Tarmac

(Continued from page 22.)

matter of plane performance.

Perhaps you, too, are considering the purchase of a light plane. If so, be certain that you are buying a plane that will fill your needs. Be certain that it carries an Airworthiness Certificate. And make certain you know just what it will do, just how much it will cost to operate, what its fuel consumption is, its tankage, and what instruments it carries. Make sure, too, that you know hangar and field fees are in your section.

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"NO FEELING MORE GLORIOUS!"

AND NOW to our letter of the month. True, it's short this trip—but that's because Carl J. Jacoby, who wrote it, doesn't mince words. He wanted to be a flyer—and he went ahead!

Light Plane Editor:

Two short years ago, I was on the other side of the airport fence, longingly watching the aircraft come and go—

and hoping that someday this expensive sport, as I figured it, would be within my own means.

Then one day, I happened to be in a group making an inspection trip at an airport. There, we came upon a new model light plane we hadn't seen close-up before. And we began firing questions at the leader of our group (he's a Transport Pilot) concerning the price for dual instruction time on the ship.

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Then, eight and a half hours later, I soloed! And BOY! When aero mag writers tell you that this is the biggest experience in a young flyer's life—believe them! I'll never forget my instructor saying, "Now take it around yourself!" *Myself! And alone!*

That front seat certainly looked funny being empty, after all that dual instruction. But I'm telling you there's no feeling more glorious than that which surges through you when you leave the ground realizing that "wonderful winged thing" is under *your* command alone! Even getting your Private ticket doesn't give you the kick you get out of soloing!

CARL J. JACOBY,
Brooklyn, N. Y.

That was a swell letter, Carl—and the two-buck check is yours! Meanwhile, we hope a lot more of our F.A. readers get the same opportunity to learn the great game of flying!

Aero Book Reviews

(Continued from page 21)

Forty-second Street, New York City. And we'd say it should be on every aviation bookshelf.

"HIGH, WIDE AND FRIGHTENED"

WOMEN are playing such a big part in aviation today that it is no wonder that another book has come along written by a lady pilot. In any event, this one—Louise Thaden's *High, Wide and Frightened*—is a real contribution to aviation literature. It's the real aero stuff—none of this "beauty of the sunset" sort of thing, if you get what we mean.

Miss Thaden, as you know, won the Bendix Trophy race in 1936, and she also copped the Women's Air Derby. Moreover, she has established several

endurance and altitude records. Her career has been filled with thrills, spills, crack-ups, and dead-stick landings. We're glad she took time out, though, to write this grand book which takes so much of the hokey out of Powder-Puff aviation.

Her story of how she haunted airports until some one taught her to fly, and how she became a flying demonstrator and eventually a record breaker, should encourage many other women to take a try at aviation. And so I sincerely hope a lot of our young lady F.A.C. members will be lucky enough to get a copy of Miss Thaden's book for Christmas. Stackpole Sons, 250 Park Avenue, New York City, are the publishers. And the price is \$2.00.

Happy Landings

(Continued from page 21)

at all is given out on the fact that the standard stock model does but 325 m.p.h. What's more, no statement has been forthcoming to show that Germany has even *one* squadron of these fighters. No records are presented, and no facts ever stated. All they say is: "Germany has a marvelous air force. They have 9,000 fighting planes. And they could blow Paris and London off the map in an hour!"

No one seems to consider what the French and British might be do-

ing while all this was going on. And it might be interesting to turn back the pages of history to see exactly what the German raiders did during the 1914-18 scrap. Actually, not one air raid was really successful from a *military* standpoint. A total of seventeen raiding Zeppelins were shot down! And in one raid, 23 Gothas attempted to attack London and only seven returned.

Meanwhile, we say: Those Nazis wish they had 9,000 war planes—and pilots to fly them!

Fly the F. A. "Xmastick"

(Continued from page 36)

runners. Santa's head may be cut from a separate piece, if you wish. A length of thread may be strung from the reindeer to the sleigh to carry out the idea of reins. Sand Santa smooth, and for better effect, try marking in his features, etc., with colored pencils. Don't use dope or paint, for they would tend

to add extra weight.

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INSTRUCTIONS

AVIATION APPRENTICES—Altruistic Young Men interested in training for entering Aviation as Apprentices see Mechanix Universal Aviation Service ad above.

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MISCELLANEOUS

WANTED ORIGINAL POEMS, songs, for immediate consideration. Send Poems to Columbia Music Publishers, Ltd., Dept. 268, Toronto, Can.

by warping the stabilizer.

Now "crank up" about 50 turns in the rubber, and hand launch the model. Notice its line of flight and make any ad-

justments as to turns by warping the rudder to the left or right. When the flight circle suits you, wind the *Xmastick* to the limit and let 'er rip!

Beginner's "Kayo" Gas Model

(Continued from page 38)

mirably. Spray the entire plane with a fine mist of water. After it has dried thoroughly, apply two coats of dope.

Any color scheme may be used and the number of coats is up to the builder. The original *Kayo* was red and white. This is an attractive combination and gives good visibility against most sky conditions.

The motor is bolted directly to Bulkhead No. 1 with 4-40 machine or stove bolts. The wing is mounted on the $\frac{1}{4}$ " flat mounts. It is fastened with a "wing saddle" of $\frac{1}{4}$ " flat rubber attached to the wire hooks on either side.

TEST FLYING

BEFORE attempting to fly the plane, balance it with the motor and ignition equipment installed. The model should balance slightly *tail heavy* at a point about one third of the distance back from the leading edge of the wing. If it does not, shift the position of the batteries in the fuselage until this balance is obtained. The steep climb of the original cannot be duplicated unless the settings from the thrust line as listed on the drawings are followed explicitly.

If you have followed our directions closely, hand gliding before power flights may not be necessary. However, if you are lucky enough to live near a nice patch of deep grass, powerless gliding experiments are certainly "in order." Launch the plane from about shoulder height. Give it a firm thrust forward. Do not throw it—merely give it a "firm push!" The model should make a flat level glide of about 50 feet.

When *Kayo* is ready for her first power flight, give the ignition a final check up. Have the motor running smoothly, and set the timer or gas supply for a run of about 15 seconds. (We're assuming, of course, that by now you and *Kayo* are in a large, level field with a nice runway).

With the engine's throttle set at about three-fourths normal revs. release the ship and run alongside, guiding it, if necessary, by a *slight* touch on the wing tip. To you fellows who think this is altogether impossible, I might add that the take-off run is usually only about ten feet, a distance that should not strain even the shortest legs in making sure that *Kayo* leaves "terry firmy" safely.

If the model shows a tendency to stall, you can adjust this by shifting the position of the battery box slightly forward, while if the climb seems sluggish, move the battery box toward the rear and rev the motor up slightly. If *Kayo* banks too steeply, fit an aluminum tab to the trailing edge of the rudder.

Never fly your ship with a full (or even a half full) tank of gas. The best and safest way to regulate the length of flight is to use an ignition timer. A

limited fuel supply is next best.

If you should strike a snag in building or flying *Kayo*, drop me a line in care of **FLYING ACES**. Describe the difficulty in detail and enclose a stamped return envelope, and I'll do my best to straighten you out. And now there's just one more thing—the

BILL OF MATERIALS

TEN strips $\frac{1}{4}$ " by $\frac{1}{4}$ " by 72" hard balsa, one $\frac{1}{4}$ " by $\frac{1}{4}$ " by 72" white pine strip, five $5/32$ " by $1/16$ " by 36" balsa strips, one $\frac{1}{4}$ " by 1" by 72" balsa strip, one $\frac{1}{4}$ " by $\frac{1}{2}$ " by 72" balsa strip, one $\frac{1}{4}$ " by $\frac{1}{4}$ " by 18" balsa strip.

One $\frac{1}{4}$ " by 6 $\frac{1}{2}$ " by 3 $\frac{1}{4}$ " pine sheet, twelve $1/16$ " by 3" by 36" sheets balsa, ten $3/32$ " by 2" by 36" sheets balsa, five $\frac{1}{4}$ " by 2" by 36" sheets balsa, one $\frac{1}{4}$ " by 2" by 36" sheet balsa.

One $1/16$ " by 3" by 36" plywood sheet, one $\frac{1}{4}$ " by 2" by 18" plywood sheet, one $3/4$ " by 4 $\frac{1}{4}$ " by 6 $\frac{1}{2}$ " medium balsa block.

Six feet $\frac{1}{4}$ " spring steel wire, one pair $3/4$ " air wheels, one spool tinned wire, one pint cement, one pint dope, five sheets bamboo paper (or silk, optional), razor blade, coping saw, sandpaper, and—patience and elbow grease.

Answers

TO QUESTIONS ON PAGE 28

- 1—Wilmer Stultz was the pilot of the *Friendship*. It carried Amelia Earhart over the ocean as a passenger in June, 1928.
- 2—A stowaway hid in the tail of the *Yellow Bird* flown by Assolant, Lefevre and Lotti. The added weight prevented them from reaching Paris; they had to land in Spain.
- 3—Miss Ruth Elder was the passenger aboard the *American Girl* flown by George Haldeman.
- 4—A Dornier Wal, flown by Capt. Frank Courtney on a trans-Atlantic flight in 1928, caught fire 650 miles off the Azores, but was successfully landed at sea. The crew was saved, via a radio call, 18 hours later.
- 5—The first air attempt across the Atlantic was made in 1873 by William H. Donaldson in a balloon from Brooklyn. He reached—New Canaan, Conn.
- 6—Only one member of the original Junkers crew is alive—Major James Fitzmaurice. Capt. Hermann Koehl died recently, and Baron G. von Huenefeld died several years ago.
- 7—Captain Charles Nungesser's ill-fated plane was called the *White Bird*.
- 8—Clarence Chamberlin's *Bellanca Columbia*, with Charles A. Levine as passenger, made the first non-stop flight from New York to Germany.
- 9—The *Miss Veedol* was flown by Clyde Pangborn and Hugh Herndon.
- 10—The *Untin' Bowler* was the name given to a Sikorsky amphibian used in an attempt to fly the Atlantic in 1929 by Parker D. Cramer, Robert Gast and Robert Wood.

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Wingspan	36 in.	Airfoil section	Göttinger 549
Overall length	50"	Glide Ratio	16 to 1
Wing Area	8.5 sq. ft.	Rate of Climb	Approx. 700 ft. per min.
Total weight with motor and control mounts	9 1/2 lbs.		

Complete kit, including a pair of 3 1/2" Scientific Pneumatic rubber wheels. **\$6.95** Postpaid **\$7.95** Postpaid



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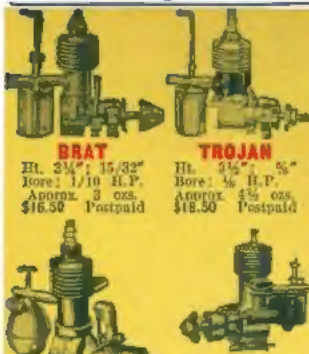
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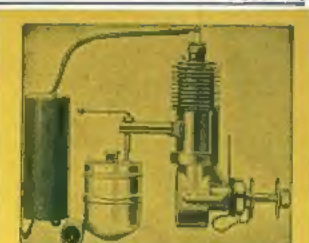


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